CUSTOM

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GE

AUTHOR

Analysis of GEIS

TITLE

INPUT

ANALYSIS OF

GEIS

FOR

CSC

APRIL, 1977

FOR:

GAIL LEPARD
COMPUTER SCIENCES CORP.
650 N. SEPULVEDA BLVD.
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GE's HISTORY AND COMPANY OVERVIEW

- The General Electric Company grew from the Edison Electric Light Company, which was organized in 1878 to develop Thomas A. Edison's incandescent lamp. The Edison Electric Company and seven other Edison companies were combined in 1889 into the Edison General Electric Company. In 1892 that company and the Thomson-Houston Company were combined to form the General Electric Company with Thomas A. Edison as one of its directors. The year 1978 will mark 100 years since Thomas A. Edison organized the first of the companies which became the General Electric Company.

- Today General Electric (GE) is the largest-diversified industrial corporation in the world and represents about]% of United States GNP. After experiencing two major negative situations in the 1960's--price fixing and large losses in the computer, nuclear and jet engine business--GE has grown steadily in the 1970s. In 1975, earnings declined slightly. During 1976 sales grew 10% while earnings during the same period grew by almost 29% as compared to the equivalent 1975 period. With the acquisition of Utah International on a pooling of interest basis, sales for 1976 totaled $15.7 billion an increase of 11% over the previous year while earnings rose to $930 million a 35% improvement. Management style has been transformed from a sales to a financial orientation. Future growth should be relatively stable and consistent.

- Between 1965 and 1975, GE sales grew 7.6% annually; earings before tax, 4.9%; and after tax earnings, 7.0%. During the past five years, sales growth accelerated to 10.3%, and after tax earnings expanded 5%.

• The jet engine business investment is paying off and GE
jet engines are now powering the Boeing 747, the DC10 and the A
300 European Airbus and GE is the engine contractor on the B1
bomber.

• Because of size and diversity, GE has problems in expanding faster than
the economy. Having either the number-one or number-two position in most
markets served makes it difficult to forecast growth faster than the markets.
Antitrust considerations are important for steam and gas turbines, lamps,
and major appliances.

• For the past several years, major acquisitions were thought to be
out of the question growth because of antitrust implications. Obviously,
the Utah International acquisition changes this perception. Expansion
from new businesses or new products must be in areas of large potential
to have any sort of impact on the multi-billion GE sales base.

• The goal of current management is to concentrate on the traditional
businesses as well as on businesses whose growth is faster than the GNP rate.

• The unannounced goal is a better performance in the next 5 years than
that achieved in the past 5 or 10 years.

CORPORATE MANAGEMENT AND PHILOSOPHY

• Mr. Reginald Jones, the sixth chief executive officer since GE was
incorporated in 1892, assumed the position in December 1972.

• Mr. Jones has a financial and accounting background, beginning with
several years as a GE internal auditor and ending with tenure as vice-

- Despite the simultaneous losses which would have killed any other firm General Electric, with 1975 sales of $13.4 billion, is today the world's largest diversified industrial corporation.

EMERGING FROM NEAR DISASTER

- In the 1960s, GE was faced with three sizable opportunities. All three were pursued at about the same time. To expand its $5 billion sales base, participation in areas where GE was not a leader was initiated. The strategy resulted in a disappointing earnings performance in the latter half of the 1960s. A disproportionate allocation of resources was made to future businesses, such as computers, atomic power, and commercial jet engines. These areas required large investment capital, and the problems were more difficult than top management had estimated.

- GE lost an estimated $500 million on its computer mainframe venture between 1965 and 1970. During the same period the company also lost $350 million on its nuclear reactor venture and $165 million were blown on jet engines. In addition, some of the highly profitable traditional businesses were neglected. The neglect resulted in capacity shortages in certain very profitable areas such as major appliances, for which market share was lost.

- A redirection began in 1970 when the computer business was sold to Honeywell. Atomic power losses also declined in 1970. However, full profitability in this business is not expected until 1980.

president - Finance 1968 to 1970 and senior vice-president 1970 to 1972. He also spent many years in direct line responsibility with various GE business units.

● Mr. Jones continued the refinement of certain management tools, which were initiated under Mr. Borch, into what is now called Strategic Planning. The techniques were used in the decision to disengage from the mainframe computer business, and Mr. Jones is given the majority of the credit as the force behind that decision.

● Mr. Parker and Mr. Weiss have been vice-chairmen since December 1968, and Mr. Dance since March 1972. Their office was created in the latter years of Mr. Borch's (Mr. Jones' predecessor) tenure, in an attempt to bring greater top management depth and control over a decentralized company, reversing somewhat the trend toward decentralization initiated in the early 1950s by the chief executive officer, Mr. Ralph Cordiner.

● Mr. Cordiner developed a divisionalized organization run by almost completely autonomous general managers. After the antitrust problems of the late 1950s and early 1960s, the rapid expansion of the company in the mid-1960s, and the almost disastrous losses in three businesses, top GE executives felt that a move back to some form of centralized management was necessary. Thus, the office of vice-chairman was created, and corporate strategic planning was initiated. Under Mr. Borch, the vice-chairman did not have any direct operating responsibility.

Chart 1
General Electric Company
Management Organization

CHAIRMAN OF THE BOARD &
CHIEF EXECUTIVE OFFICER
* R.H. Jones (57)

VP-FINANCE
A.O. Way (45)

VP & STAFF EXECUTIVE
EXECUTIVE MANPOWER
R.L. Johnson (61)

SENIOR VP-CORPORATE
STRATEGIC PLANNING
& STUDIES
* C.E. Reed (61)

VP-CORPORATE
RESEARCH & DEVELOPMENT
A.M. Bueche

SENIOR VP-GENERAL
COUNSEL
* R.M. Estes (62)

VICE CHAIRMAN OF THE BOARD
& EXECUTIVE OFFICER
* H.L. Weiss (58)

VP & GROUP EXECUTIVE
COMPONENTS & MATERIALS
GROUP
J.F. Welch, Jr. (39)

SENIOR VP-
CORPORATE DEVELOPMENT
* O.L. Dunn (60)

SENIOR VP-
CORPORATE ADMINISTRATIVE
STAFF
* H. Cross (58)

VP-CORPORATE EMPLOYEE
RELATIONS
L.C. Maier, Jr.

MANAGER-
UNION RELATIONS
J.R. Baldwin

VP-CORPORATE
PUBLIC RELATIONS
O.S. Moore

MANAGER-
INVESTOR RELATIONS
J.L. Ingersoll

F.J. Eckert
L.L. Thomann

VICE CHAIRMAN OF THE BOARD
& EXECUTIVE OFFICER
* J.S. Parker (56)

VP & GROUP EXECUTIVE
INTERNATIONAL CANADIAN GROUP
J.F. Burlingame (52)

VP & GROUP EXECUTIVE
SPECIAL SYSTEMS AND
PRODUCTS GROUP
T.A. Vanderslice (42)

VP & GROUP EXECUTIVE
AIRCRAFT ENGINE GROUP
G. Neumann (57)

VP & GROUP EXECUTIVE
AEROSPACE GROUP
M. Morton (61)

VICE CHAIRMAN OF THE BOARD
& EXECUTIVE OFFICER
* W.D. Dance (52)

VP & GROUP EXECUTIVE
MAJOR APPLIANCE GROUP
S.C. Gault (48)

VP & GROUP EXECUTIVE
CONSUMER PRODUCTS GROUP
R.R. Frederick (48)

VP & GROUP EXECUTIVE
POWER GENERATION GROUP
E.E. Hood, Jr. (44)

VP & GROUP EXECUTIVE
INDUSTRIAL & POWER
DELIVERY GROUP
R.U. Kurtz (57)

*CPC Corporate Policy Committee.

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- One of Mr. Jones' first moves as chief executive officer was to give the vice-chairman direct responsibility of the 10 operating groups of that time. Functions of the latter include overall control of large businesses and management selection, planning, and review.

- One concept under Mr. Cordiner and Mr. Borch was professional business management — a good manager can manage any business. There was much shifting of managers until the losses in the computer business convinced top management that the concept should be modified. Some switching around is still occurring, but the group managers are becoming more permanent and more specialized.

- Although GE is not immune to management problems, GE gives the general impression of being as well run as any large firm can expect. Because of its excellent training programs and planning techniques, GE has been considered an excellent training ground from which other corporations have often drawn executives.

STRATEGIC BUSINESS PLANNING

- GE has always been a pioneer in corporate planning. The strategic planning concept initiated under Mr. Borch in the late 1960s was refined in 1972 by Mr. Jones. GE is divided into 42 Strategic Business Units which range in size from the Major Applicance Group to the Battery Department.

- The GE planning concept is based on developing strategic and tactical information on each SBU. This information is then put into a grid so that a value can be assigned on each critical element. The evaluation covers:

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Markets--size, growth, pricing, segmentation; Competition--domestic, foreign, concentration, changes; Technology--patents, know-how, licenses; Profitability--for leader and followers, return on sales, return on investment, capital intensity; and Other--timing, environment, regulation. In addition, short- and long-term earnings growth must be balanced.

● After all the information is collected, the decision is made whether the SBU has a low, medium, or high GE business strength rating and a low, medium, or high industry attractiveness. The two points are laid on a grid as shown in Chart two The intersection of the two points on the grid indicates the SBU classification of the business. There are 81 possible combinations which can be obtained.

● In combination one, the SBU is rated invest/grow, and GE will expend substantial dollars to take advantage of the strong situation. The second example is a borderline case and presents the hardest decisions in which GE could invest dollars or capture earnings. In the third combination, earnings will be generated, but the business no longer warrants much additional investment. If GE's market position is low and the business is unattractive, GE will consolidate by reducing investment and taking advantage of a strong cash flow. Should an advantage to being in the business not be apparent, GE will divest.

● The Corporate Policy Committee--chairman, three vice-chairmen, four senior vice-presidents, and vice-president--finance--make the final decisions on which phase each of the GE businesses is in and how many

CHART 2
GENERAL ELECTRIC COMPANY

Industry Attractiveness

(1)
Industry Medium
GE Strong
Invest/Grow

(2)
Industry High
GE Low
Select/Earn

(3)
Industry Weak
GE Medium
Harvest/Divest

Invest/Grow   Select/Earn   Harvest/Divest
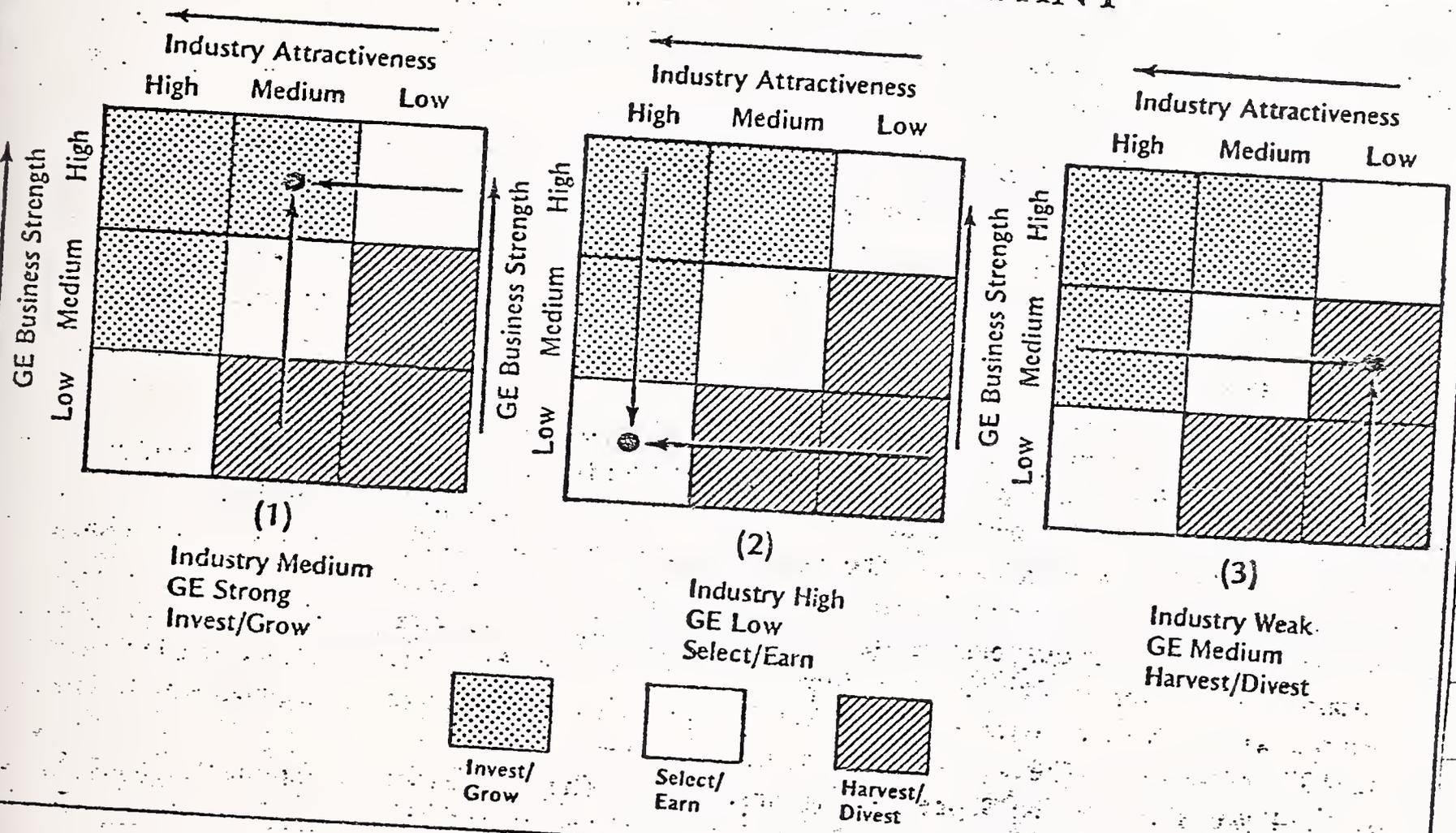
capital dollars each will receive. Strategy and incentive compensation
are also determined.

● Using the SBU method, GE has eliminated mainframe computers, houseware
products such as vacuum cleaners, fans, heaters, automatic blankets, and
blenders, as well as, phonographic sets, industrial process computers,
General Learning, and Tomorrow Entertainment.

● Strategic planning has also caused GE to accelerate programs such
as medical products, communications, batteries, specialty plastics, and
synthetic materials such as diamonds and borazon. Strategic planning
also helped to convince top management not to embark on uranium enrichment
and to deemphasize the entire nuclear program in terms of new investment
dollars.

● Although most good companies are doing strategic planning in one form
or another, at GE the program is a manifestation of a conscious effort
at planning that seems to be working. After four years, management is
still very enthusiastic about the concept.

● While strategic planning did not forewarn GE of the 1974-75 recession,
it did help the company to react to the situation by establishing trigger
points at which cutbacks in investment and manpower were made.

● The danger of the SBU concept is too much reliance on a highly
structured system, which could result in stifling initiative and inter-
company cooperation. One of GE's major strengths is its large technical
base and its ability to offer complete system packages that cut across

department, division, and even group lines; these forces need to be

harnessed. An organization capable of reacting rapidly to broadly based

customer demands is theoretically more feasible within a centralized

environment. Some of the old attitudes of decentralization, however,

permeate the GE organization. Top management must therefore exercise

the delicate balance between tight control and encouraging initiative.

HISTORY OF GE's COMPUTER SERVICE BUSINESS

- GE was the first compny to offer time-sharing as a commercial service in 1965 after a cooperative development effort with Dartmouth produced the BASIC programming Language. At that time, the service was being used on a local basis in New York and Phoenix. In order to expand, the General Electric Information Services Department was founded in Bethesda, Maryland. During the late sixties, the department added computers in 17 information processing centers around the U.S. Thus, in 1965 GE became a supplier of both Hardware and Services. The service started in the engineering problem solving area.

- By 1968, the service had evolved to the point where customers wanted more than to share the processing power of a computer sumultaneously. Simple problem-solving want't enough. "Users needed the capability to gather process and disseminate data over wider geographic areas, thus remote data processing began to evolve out of necessity. The software supporting the service evolved from the MARK I service providing simple interactive problem solving to BASIC I, a simplified version of MARK I available primarily as a training tool; MARK II, a conversational service with more sophisticated capabilities than MARK I; RESOURCE, a batch processing service; and MARK DELTA, a data management service.

- As the users in-house computers became logistical bottlenecks because data had to be mailed or telexed to the computer facility

and key punched and processed. Delay was built-in, and remote facilities
found it difficult to get their work done. Local time-sharing made turn-
around easier, but there was still no easy-to-use centralized way to make
bulk information instantly available."

● This information logistics bottleneck was eased by the introduction
of remote batch terminals and networks. In late 1969 and early 1970, GE
implemented the first phase of the international information network,
consolidating resources into one single processing site, or SUPERCENTER
located near Cleveland; now over 5000 customers in over 500 cities in
North America, Europe, Asia and South America can access any of the
3 SUPERCENTERS with a local call.

● With the network GE's customers were able to collect large amounts
of data, however the Software was still primitive. The next step in the
evolution – the MARK III service, essentially a consolidation of all
previous services was announced. It consists of two parts: MARK III
Foreground, the former MARK II service, and MARK III Background, the
former Resource service. Background service must be accessed through
the Foreground service.

● In MARK III Foreground, the user can choose among three modes of use:
Interactive, for immediate program execution; Independent Run, a deferred
run where the user can designate the time and priority of execution; and
Sleep/Wake, a mode in which a program is alternately "asleep" (where it
suspends execution) or "awake" (where it is executing). A "sleeping"
program can be activated (1) at a specified time, (2) by a WAKE command

in another program, or (3) by a terminal command.

In MARK III Background, the user has three priority options: express, normal, or overnight, where processing starts in 15 minutes, 3 hours, or 24 hours, respectively.

GE supplements these data processing services with customized software development, terminal sales, and off-line data conversion services.

• In 1970, when General Electric transferred most of its computer equipment business to Honeywell, the feeling was prevalent that an orphan got left on GE's doorstep — a fatherless offspring overlooked in the rush. The computer time-sharing business.

Prospects for the new business did not seem bright. Undercapitalized competitors were going out of business and prospective customers didn't realize the computer services business was still a part of General Electric.

• However seven years later, GE is the largest time-sharing vendor in the world. Dr. Feeney, the Vice President and General Manager, gives major credit for the change in the attitude of Information Services Division to Arthur Peltosalo, now Power Delivery Group Executive, who was in charge of the Divsion in 1970. Dr. Feeney indicates that even in the midst of retrenchment; Peltosalo encouraged the Division to build its network. "He kept on making deliberate, discretionary expenditures in pursuit of the goals we believed in. Art's leadership was also crucial in the development of several key individuals around here."

• Dr. Feeney, a former manager of Corporate Strategy Operation, was

in the Division as a department general manager during those early years
and his persistence helped to create a computer service entity dedicated
primarily to serve most of the FORTUNE 500 companies.

FUTURE DIRECTIONS AS EXPRESSED BY MANAGEMENT

● GE's stated goal is to evolve into a low cost, highly reliable
computer service at the fingertips of every businessman - an immense
system - always on-line with the constant capacity for upgrading and/or
modification - providing continuous service around the clock, on all
continents, in all time zones to meet worldwide company information
processing needs. This super system, with unprecedented economic
and performance advantages, is GE's Goal."

● GE's aim, is to provide total information service, equal to anything
a company could buy itself, with a lot of features that no single com-
pany can afford. True utility computing is the final goal, and the
whole future of computing, according to GE is management.

● How soon can this be accomplished? Feeney believes in ten years
the real job will just be beginning. Feeney believes by that time
GEIS will be ready to fill orders for true utility computing and the
computer hardware industry will be noticing GE as a competitor for the
first time.

- Factors working in GEIS' favor will be : CRITICAL MASS. In 10 years a compounded 20% yearly growth could make GEIS a $1.5 billion business. Thus, size alone could produce respectability and credibility among prospective users.

TECHNOLOGICAL LEADERSHIP

GE will be seriously affecting the frontiers of computer technology and manufacturers will build equipment just for the GE network.

The Network providing the users with:

- Fast consolidation of business information
- Access to processed information
- Decentralized computer capability
- Centralized control
- Multiple path redundancy
- Time savings.

- Many of the GE Information Services Division employees believe that they will be leaders in one of the largest service industries in the country.

- The Division became profitable in 1972 and has continued to be profitable since that time.

- Dr. Feeney claims "We've chosen our corner, it's turned out to be the right corner, we're better at it than anyone else in the world, and we're going to stay that way." This somewhat arrogant attitude is both

an asset and a liability. An asset when the Division needs to be "sold"

internally; a liability when it is reflected to the outside work as a 'non-

marketing oriented attitude".

ORGANIZATION OF GENERAL ELECTRIC INFORMATION SERVICES DIVISION (GEISD)

- George J. Feeney, Vice President and General Manager of GEISD reports to Thomas A. Vanderslice, Vice President and Group Executive of the Special Systems and Products Group.

- In addition to Mr. Feeney, the following report to Mr. Vanderslice:

    - Christopher T. Kastner, Vice President and General Manager of the Communication Systems Division.

    - Eriwn M. Koeritz, Vice President and General Manager of Construction Materials Division.

    - Kertis P. Kuhlman, Vice President and General Manager of General Electric Supply Company Division.

    - Carl J. Schlemmer, Vice President and General Manager of Transportation Systems Division.

- The only common element between these diverse business areas is that they are all considered high potential growth areas by the corporation requiring special nuturing and close watching. In addition, the present and future terminal products of the Communication Systems Division can be marketed to the end user by the GEISD sales force.

- Reporting to George J. Feeney are eight managers; six of whom have General Manager status (Legal and Relations are the exceptions). See Exhibit

- Reporting to Paul Ledley are Paul Wexler and Warren Sinback is the facilities man, responsible for hardware which includes the Amsterdam

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ORGANIZATION: GE DOMESTIC

George Feeney

Vice President

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ave Sheppard        Bob Hench           Paul Leadley          Leo Ramir
                       GM                   GM                    GM
  Relations           Marketing          International          Finance


      Roger Hobbs          Ray Marshall      Thomas Little      Dave Sherman
         GM                    GM                 GM
        Sales              Sys. & Tech.        Planning            Legal


                    Paul Wexler          Warren Sinback
                    Int'l Projects        International
                    Oper Manager        Facilities Mgr
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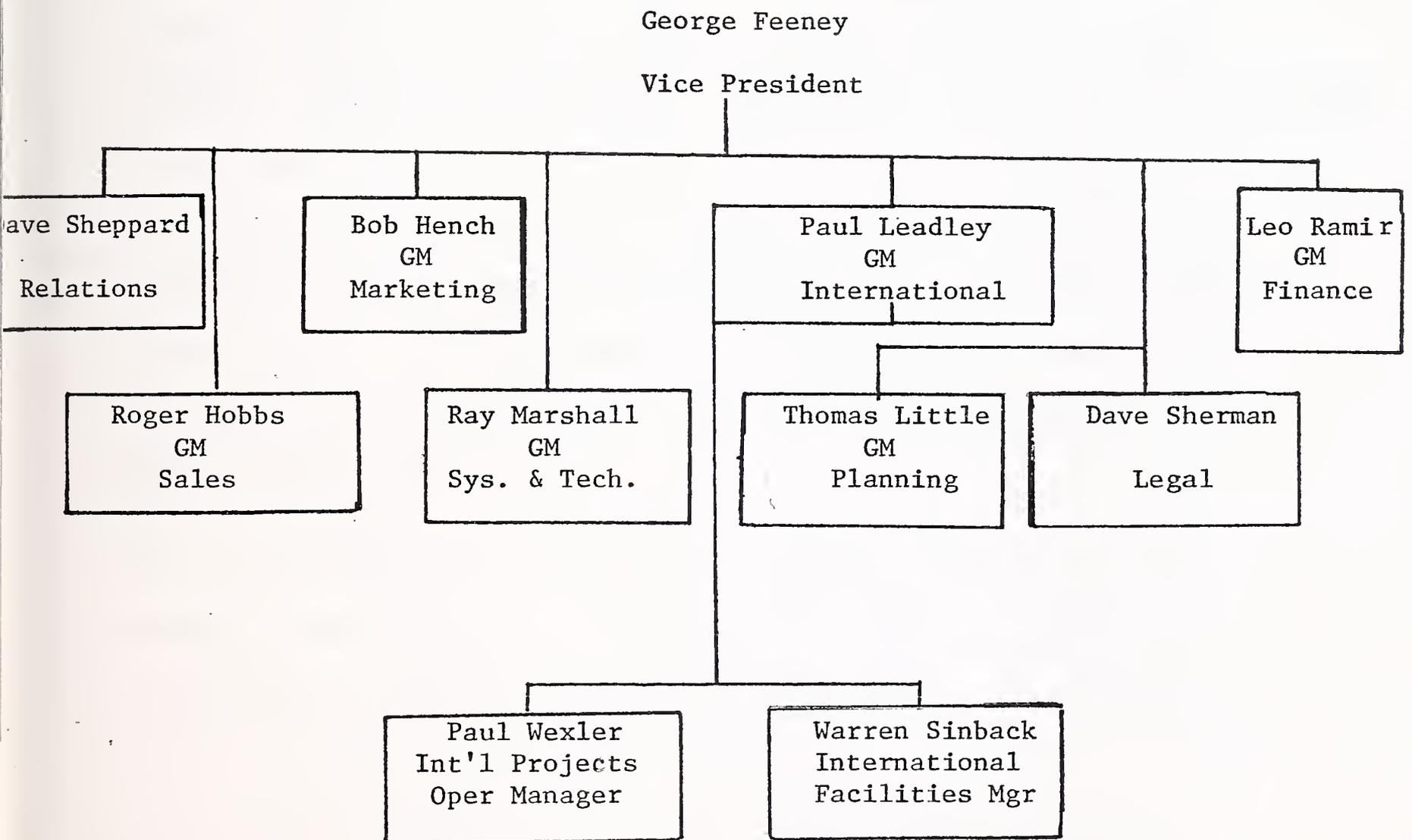
super center and all communications facilities including South America
and Japan.

● Paul Wexler, whose title is International Projects Operation Manager
performs primarily marketing-planning functions, deciding on services
expansion, where they should go, how they should get there, who they
should sell to when they get there.

● The marketing structure reporting to Roger Hobbs consists of seven
geographic regions. They are Atlantic, Central, Eastern, Northeast,
Pacific, Sourthern, and Southwest. Additionally, there are four non-geograph-
ical regions with the same status. They are Federal Governmnet, GE-Erie,
GE-Lynchburg and GE-Switchgear. The last two are run on a facilities
management contract. The GE-Erie complex is not a facilities management
site, but is a very large timesharing location with thousands of users
connected to GE's super centers. The complex has an independent Account
Manager with regional status.

● At the branch level, there are 40 branches, each with its own
manager, plus an additional 11 sub-offices. These sub-offices are
satellites of branches and the man in charge there is a sub-branch
manager reporting to the branch manager. The total field force under
Roger Hobbs is budgeted at 600 people. (This includes everybody).

● Significant within that 600 are the professional services people.
They are now called Customer Application Operations (CAO) contract
programming by another title. There are approximately 100 people

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                    ┌─────────────────────────┐
                    │    DIVISION MANAGER      │
                    ├─────────────────────────┤
                    │         Feeny           │
                    └─────────────────────────┘
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┌─────────────────────────┐        ┌─────────────────────────┐
│         SALES           │        │       MARKETING         │
├─────────────────────────┤        ├─────────────────────────┤
│    7 Regional Mgrs.     │        │         Hench           │
│      40 Branches        │        └─────────────────────────┘
│     600 Marketing       │
└─────────────────────────┘              ┌──────────────────────┐
                                         │     ADVERTISING      │
                                         └──────────────────────┘
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            ┌───────────────────────────────┐
            │    INDUSTRY APPLICATIONS       │
            ├───────────────────────────────┤
            │         Jack Griffin           │
            └───────────────────────────────┘
```
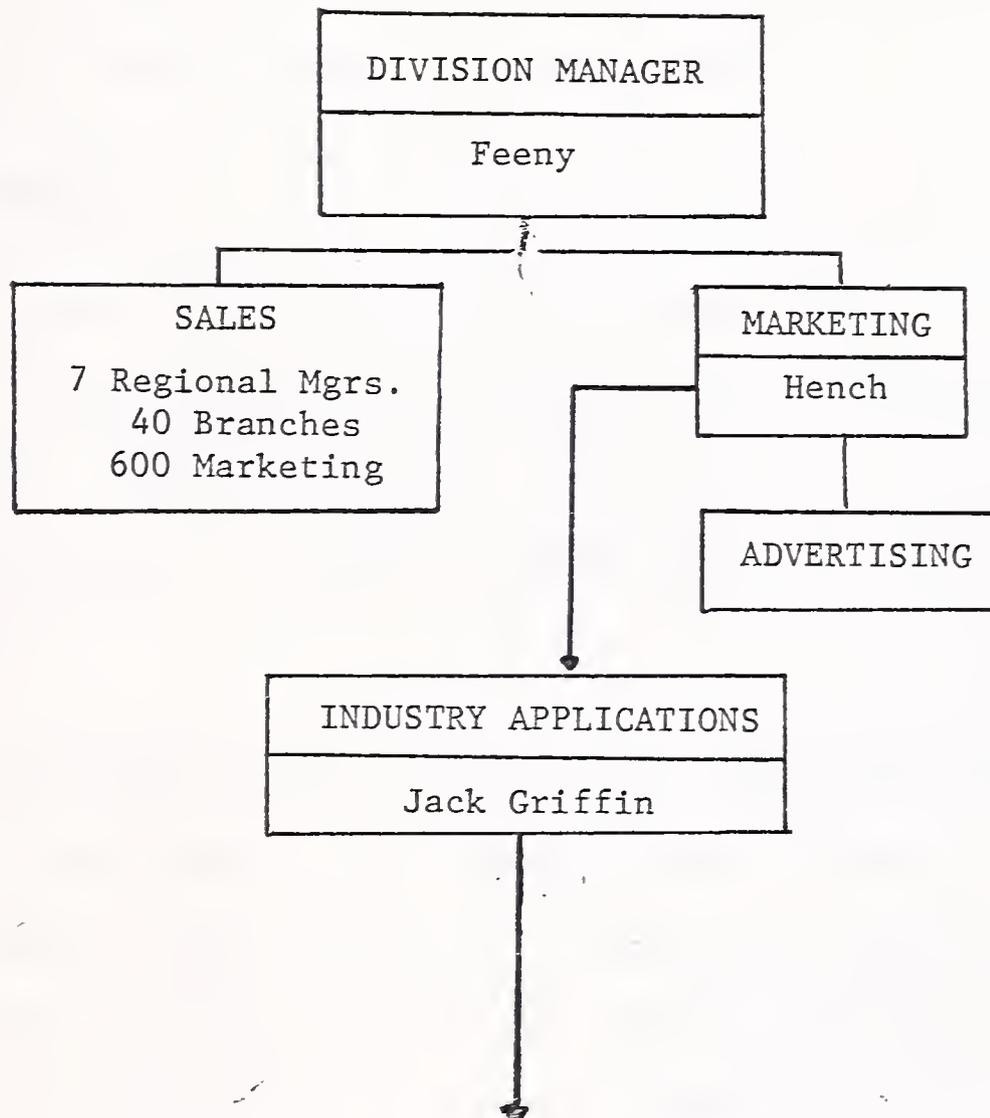
INDUSTRIES ACCOUNTS OPERATION (7 x 7)

Manager — Jack Griffin

1.	Banking Industry Accounts	— R. Mirro
2.	Utility Accounts	— R. Bice
3.	GE Accounts (Internal)	— Mac McCleary
4.	General Industry Accounts (Other)	— R. Fohl
5.	Management Service Accounts (CPAs etc.)	— A. Sims
6.	Petroleum Industry Accounts	— Ken McDonald
7.	Telephone Industry Accounts	— Vacant

Each group (IAO) has 7 industry national account representatives.

within this operation all located in the field office except for a small

cadre at Rockville.   Also included within that 600 number are all managers,

all clerical and secretarial staff, sales, support, and all the support

organizations, such as the regional training people. Of the 600 at best,

there are 150 salesmen domestically. See Exhibit

INDUSTRY EMPHASIS

●   GE has traditionally had a strong Planning and Marketing structure.
Reporting to Jack Griffin is the Industries Account Operation (IAO). This
group provides emphasis on selected industries and a tool which enables
GEISD top management to focus on selected industries and selected accounts.
See Exhibit

●   There are seven industry gorups in the organization each with its
own manager responsible for that industry area. These
senior, marketing types, from the GE organization, some have achieved
general manager status in the past and probaly, the lowest GE level of
many of these people would be 17, some as high as 18 or 19. (Chairman of
the Board = 24).

●   The IAO Managers, fulfill basically two functions:

    –   To develop a marketing plan for their industry based on surveys
    of the industry.

    –   To produce and provide sales planning and account growth plans
    for field sales.

●   The allocation of resources and time at the moment, is estimated to
be 70% for the first objective, 30% for the second. The major problem

with this group is that its resources are limited. In fact, the majority

of the resources to carry out the plan are in the field organization,

reporting under the normal line structure to Field Management. The IAO

Managers have only dotted line liaison with field personnel. The seven

managers have a common industry account support pool which consists of no

more than three people. Although they are paraded as industry experts

they are really composed of a common crew which supports the technical

requirements when needed, of an industry group.

● Basically, IAO operates as follows: there are seven industry areas,

within each of those seven, prime accounts have been selected for special

attention (i.e. a dedicated account representative). How does one become

one of the seven chosen accounts? This is based on a composition of

present and potential revenue. Potential may be composed of revenue accrued

to other service companies or realizable revenue for services which presently

either do not exist or are being done by some other method.

● Backing up these seven accounts within each industry are

approximately 15 secondary accounts. For each of the 7 major accounts

there is a national account representative. This person is part of the

Field Sales Operation and has been elected as the field man responsible

for laison and first level selling with the account. He is the interface

to the Industry Accounts Operation Manager who, in turn, is the key man

on the account. The field mans loyalty in reporting goes however, to the

regional manager and therefore, he tends to strive very hard to develop

that account within his region, rather than nationally.

- In actual fact, excluding clerical, secretarial, the Industry's Account Operation consist of no more than 11 people but appears to the outside work as though it is a minimum of 49 people with potentially many more backup people. One of the prime functions of the industry manager under his first objective is to develop a marketing plan and survey the industry to identify applications that could be sold to his industry area. No industry specific applications seem to exist except within the telephone industry.

NEW SERVICE DEVELOPMENTS

- GE plans to announce within the next few weeks a new service which is being called Data Entry Mode of Operation. Basically, the concept is to accommodate large users or organizations who wish to have an inexpensive mode of entry for large data volumes. Within Metropolitan areas, it is planned that the rate will be 75 cents per hour to enter data regardless of speed. Outside Metropolitan areas, this price is forecast to be approximately $1.25 per hour.

- After the data is collected, the user will be able to automatically get into the standard processing mode of operation commercial rates.

- It is difficult to calculate the economics which will allow GE to offer such a service, if it is announced at the planned rates. It will have a major impact on the industry. Theoretically, someone with 30-40 keypunch operators pounding away will be able to install displays, connect up to GE and load all his data onto Honeywell and have it verified.

edited. First level sorts done on GEs IBM 370/158 and dumped back to his own in-house IBM Processor for additional processing.

● Another new product area being currently analyzed at GE by the communications industry study group, has the potential of going into the network business. The structure or potential structure GE is analyzing presently is very similar to Tymnet or Telenet. GE seems to have overcome its fear of being classified as a common carrier and having to register a rate schedule. GE is definitely looking at proposals to rent their network both to other service companies as well as commercial private users.

● The impact of the domestic, and particularly the worldwide network such as GE has, would be dramatic not only on the private networks, but on the present common carriers and foreign P.T.T.'s.

SEGMENTATION OF GE DOMESTIC REVENUES

● Since GEISD does not publish its revenue figures, it was necessary to interview five different people to get the totals and the segments of the GEISD revenues.

● The 1976 GE, worldwide, retail business is estimated at $150 million. Domestically GE produced $100 million in service revenues in 1976. Segmenting the $100 million, the domestic picture looks as follows: (See Exhibit)

DOMESTIC INTERACTIVE REVENUES

GE Remote		$15
GE Facilities Management (Lynchburg & Switchgear)		3
GE Remote Processing & Interactive (Erie)		3
	Total GE	$21
IAO's	7 x 7 Accounts	
	Petroleum	4
	Telephone	10
	GE In-House	15*
	Electric Utilities	5
	CPAs	N/A
	Banking	N/A
	General & Other	N/A
	Total IAO	$40 Million
Professional Services		2.5 Million
Other Domestic Revenues		51.5 Million
Total Domestic Revenues		100 Million

* Double Count- same as above

Remote and facilities management, including the Erie complex, $6 million; professional services, contract programming $2.5 million. Of the $100 million services business, GE represents 15% which would be $15 million plus the remote and facilities management which revenues makes internal GE a $21 million account.

- 90% of the 1976 revenues are from interactive including deferred processing. The reason is that the primary billing appears as interactive since the data is entered in interactive mode, the file instructions are set up in interactive mode and deferred processing is billed as a reduced cost of the processing.

- Remote batch is almost non-existent accounting for only 5% of 1976 revenues.

- Batch processing is non-existent.

- Professional services generated $2.5 million. Remote facility management is included in the internal GE $6 million. Precise billing for Erie is not available but INPUT would estimate that of that $6 million Erie is the major part. This is based on the fact that Switchgear at bidding was forecast to be a one million dollar account. Although billings may have grown, the growth has not been significant.

- Historical revenues are difficult to reconstruct with GE accurately because of the mixed reporting methods. We stated that domestic service revenues in 1976 were $100 million. GE achieved a billing rate of $52 million in 1972 when it celebrated their first million dollar revenue week.

If we assume 1973 service revenues at $60 million, the growth in the
last four years has been between 14% and 16% domestically and a higher
growth rate overseas.

●   It is likely, however, that a substantial part of the revenue which
existed in 1973 has either disappeared or been converted. For example,
in 1973 Mark Delta still existed, the whole medical area still existed,
and the million dollars did include transfer rate on power to Europe.

●   The profit in 1976 (contribution if you use GEs terminology) was
$11 million. This $11 million is derived from all revenues including
International. This represents approximately an 8% profit ratio.

●   GEIS is targeting for $120 million domestically in 1977; the 20%
per annum is the future level of growth forecast for the division. Profit-
ability is targeted to rise to 10% and be held at that level.

HARDWARE AND OPERATING SYSTEMS

●   Domestically, GE has two super centers. One in Brook Park which is
near Cleveland, Ohio. The other is in Rockville, Maryland. Brook Park
has 6 Honeywell 6088s and Rockville has three 6088s. Also in Brook Park
are four Honeywell 6000 series, model unknown, which are committed to
background processing. GE also has an IBM 370/158 used for U.S. service.
GE is currently examining, very seriously, whether to and when to upgrade
to the new Honeywell 60 series. No specific plans have been made yet, but
the objective is to make a decision this year.

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• Two new developments in the hardware area both come from Lynchberg (home of Terminet):

    - A new intelligent terminal viewed with great interest by GEISD..

    - A new communications controller--likely to be a micro processor driven Diginet 1600 to be placed primarily in large customer installations, where it would accommodate not only concentration of the user's parts, but it would also accommodate multiple speed, multiple discipline, full duplex, high speed operation.

• GE has contined to work on integration of the hardware and the software. To date, it has failed and found it exceptionally difficult to fully integrate the two. Nevertheless, from the user's standpoint GE has built both the hardware and software front end, calling the result a Mark III.

• The user can interactively collect data and edit his work on the Honeywell systems and through hardware and software interpretation, transfer files to the IBM 370/158, perform the necessary file interpretation, transfer and then process his work on GE's IBM system, or do a first level edit, and sort and then transfer the work to his own in house 360/370.

• Some data collection is being done via the network on the Honeywell CPU's, and then media is transferred, mainly by tape, from the Honeywell CPU's to the IBM CPU's for processing.

MARKETING STRATEGY

●   The GE marketing strategy is industry and large account oriented. However, a great deal of the industry orientation is lip service because the support and R&D dollars to make a significant impact on any industry are lacking.

●   Professional services at GE-ISD are considered primarily as a support function   Mark III and contracts are bid only on work related to Mark III. This is significant since it means that GE will not bid for IBM work (VS) on the 370.

●   In bidding a contract, management, both general and field level, can influence the price to be charged to the customer; they can deflate the price below the actual cost for labor, if a contract is seen capable of producing four times its actual cost in revenue generation within its first year. An example of this would be contracted services, of $10 thousand dollars, the most significant criteria would be that on installation the application will produce a minimum of $40,000 service revenue in its first year.

●   A significant segment of GE's accounts bill $25,000 per month or more. In fact, 80% of the business comes from 20% of the users. GE has basically two levels of users:

   –   Those who spend in excess of 1,000 per month.

   –   Those who spend less than $1,000 per month. The customers who spend less than $1,000 are almost totally unsupported. The only

time they are likely to see any service or support activity is when a new salesman or support man is recruited and in all ignorance, endeavors to go out and sell or support these people. He learns very quickly that the company expects him to put his resources into large accounts and to leave the small ones to their own devices. The potential of this group is going to waste. It is very significant to analyze who these customers are and find that many of them are the Fortune 500, and one would be reluctant to say that these people had no potential.

● A feeling one gets by talking to various GEISD people regarding IBM is not as serious about selling IBM as it was a couple of years ago. The lack of marketing effort and lack of technical people employed in this area implies that IBM processing capability is a necesity, and that it is not viewed as having the major role previously envisioned for it. It does no harm to be able to go into an account and say "we have IBM equipment, and we are IBM compatible" and then proceed to sell them on the use of the Honeywell timesharing equipment. GE's IBM (U.S.) service is now primarily sold by a special sales force consisting of three geographically concentrated groups. They are respectively in New York, L.A., and Chicago. Their sales plan for 1977 is:

- New York, $2.5 million;

- L.A., $2 million;

- Chicago, $2 million.

This group is on quota, and although the other field sales people are not restricted from selling IBM, if they do, they are unsupported. Selling IBM services is not a specific part of their sales plan.

● Presently GE has no Telex interconnect capability either nationally or internationally but there are network study groups within GE to explore this business. One of the areas they are looking at is connecting Telex into the GE network. They are receiving pressure from Europe to integrate Telex into the service package.

PRICING STRATEGY

● The strategy will be to attract data entry and access to the service onto the service at a low price and produce the revenues and profits from processing.

R&D EXPENDITURES

● There is no specific R&D budget within GEISD. There exist R&D requirements within systems and technology, marketing, and planning. The main R&D activity most recently has been the internal development of all Honeywell operating systems. The total communications system has been developed internally. The only major external contracts have been for compiler development. The fortran compiler was developed externally for $250,000.

● In looking to the future no plans exist for acquiring software externally for either operating systems, or communications with the exception of compilers. It's likely that in the future GE will continue to procure the compilers externally.

● No major application packages are presently being reviewed for purchase. Similarly no major new application packages are being developed internally.

PROGRAMMING LANGUAGES AVAILABLE ON THE NETWORK

● For Mark III service, GE supports Fortran IV versions FIV and FOR and Basic in the Foreground mode, and Fortran IV, version Y and Cobol in the Background mode. The system permits use of other langauges, including Algol and Jovial, but GE does not support these.

● Basic for Mark III Foreground--a G.E. company version with the following extensions: string processing manipulation of alphanumeric data; ability to save programs in object form, create binary files, create scratch files, initialize all lists, tables, variables to zero, and random number generation to one; random and sequential access of data files; unbuffered input/output; multiple assignment with LET; conditional branch with ON GOTO and OB BREAK; FILE. CALL and CHAIN capabilities; file manipulation capabilities to append data at the end of a file, handle unstructured files and variable length fields, set the length of lines and records, and specify the character used as a delim-iter between file data elements; limited commands from programs; shared file access; and the option to turn off subscript checking.

● GE's Mark III version of Basic operates with no size limitation for an executable file and 5,040,000 characters for an ASCII data file, eight data files can be open simultaneously. The object code limit is 14,800 words.

● Fortran FIV for Mark III Foreground--a GE version of Fortran IV to ANSI specifications X3.9/1966 with the following extensions: programs can be stored in object form; CHAIN and FILE commands provide for

program chaining; definitions of variable and arrays include type and content specifications; specification statements allow storage allocation for arrays; and multiple replacement statements can define arithmetic or logical calculations. This version of Fortran permits a 32,000-word object code.

●   Fortran FIV also includes extensive commands from programs; core image files; overlays; shared access to files; temporary or permanent files; the Symbolic On Line Debug SOLD package; diagnostics; NAME-LIST bit manipulation routines; alphabetic character functions. Fortran FIV is a free-form source language with multiple statements per line. Unlimited continuation statements are allowed.

●   Fortran FOR for Mark III Foreground--an earlier version of Fortran FIV, which is being temporarily retained for customer convenience.

●   Fortran Y for Mark III Background--a batch-oriented version of Fortran IV, almost fully compatible with Fortran FIV. It handles source files of the following types: Fortran FIV ASCII file, BCD card image file, compressed deck file, formatted BCD line image file. Source file input may be in standard or free-form format. The compiler will process both ASCII and BCD character sets. If several programs have the same options, they can be stacked and compiled in one operation. The compiler provides analyses for statement- or extended-level optimization. It also includes a series of over 500 diagnostics.

●   Language features include: ENCODE/DECODE for memory to memory conversion; list-directed formatted I/O; random file I/O; mixed-mode

arithmetic; subscripts in any expression; DATA initialization in any type of statement; end-of-file clause in READ statements; capability for pause or stop with terminal display; capability for ENTRY, IMPLICIT, PARAMETER, and CHARACTER statements; format specifiers; quoted character constants; an error return clause in READ and WRITE statements; switch variables; type statements with size-in-byte notation; a function to provide list string and field capabilities; exclusive "or" capability; argument validation for built-in functions; and null label fields in the arithmetic IF statement.

● Cobol for Mark III Background--Standard ANSI Cobol X3.23-1968, with a program linking extension.

PROGRAM CONTROL, EDITING AND DEBUGGING FACILITIES

● GE's network operating system controls the security and user accessibility to the network and its resources and schedules and monitors all central system tasks. The Mark III operating system controls Foreground processing, while the GCOS operating system handles Background processing.

CONTROL LANGUAGE

● GE provides an interactive control language of English-type commands. For Foreground processing, the following kinds of commands are available: system access, to initiate or terminate a terminal session; system control, to specify or terminate program execution or change the language used; file control, to create, modify, store, retrieve, copy, delete, or sort files, to store or retrieve files off-line, and manipulate file

names; I/O control to identify or change the type or transmission rate of the terminal, to allow binary file input or output, or to redefine control characters. Other Foreground commands allow the user to perform terminal editing; obtain information about the status of files, current usage, the system, or the terminal; and control file access permission. The user can initiate many commands under control of his programs. He can also place Foreground commands in files to set up a job stream.

● Commands available to the user for Background processing enable him to submit a job deck to the background stream; a library program assists him in preparing control card format; create, modify and delete background files; transfer files between Foreground and Background services; stop processing or abort a previously submitted job; inquire into job status; convert character sets; inspect and edit control card formats; and examine output. Background processing commands can be issued from the user's terminal, from a directive file on the Foreground system, or from a current file.

EDITING AND DEBUGGING

● For Foreground processing, GE provides three editors: EDIT, TEDIT, and RUNOFF.

  - EDIT is a line editor used to make major changes or major rearrangements to programs, data files, or text. It enables the user to move, combine, delete and duplicate lines; adjust line numbers, and list file contents.

  - TEDIT is a text or string editor primarily used for debugging programs, changing data files, or drafting text for documents and

reports. It lets the user find and display a string of data; change, replace or add to it; and verify changes. Two commands, CHANGE and LOCATE, are also system commands, so the user can issue them without formally entering TEDIT.

- RUNOFF is a format editor, used to prepare attractive output. Its functions include centering, spacing, justifying, inserting footnotes, and other adjusting desired.

● Editing aids in Background mode consist of two system commands. The first enables the user to examine background output; the second permits him to inspect and edit job decks and control cards.

● GE's debugging facilities consist of aids included in the programming languages, a tracing facility in Basic, and the Symbolic On-Line Debugging (SOLD) package.

SOLD is an interactive debugging package that operates on Fortran FIV programs. It allows the user to halt a program's execution at specified points and print values associated with program variables. It also provides tracing capability.

SECURITY

● The basic requirement to access GE's network is a valid user number. An optional security measure is answerback checking: Although a user number is valid, it must be entered from a terminal permitting use of that number. A password system can also be set up in conjunction with user numbers.

●   The user number restricts a client to programs and files in his own subscription, and prevents others from listing or accessing that data. Within his subscription, the user can grant other users or user groups permission to access some or all of his files. If he wishes, he may grant general permission with only certain users in his subscription excluded. He can revoke permissions at any time. When giving permission, the user can limit the type of usage allowed to write, append, read-only, or execute-only levels.

●   Other network security features include:

-   File subsystem -- This system lets clients protect their files to any extent that they choose. It includes a feature that allows the user to lock out additional users when revising a file; this prevents two or more people from writing simultaneously on the same file record.

-   File names -- Enables the user to prevent unauthorized use of particular files within a subscription. As a precaution against erasing a file by mistake, users cannot save two files that have the same file name.

-   File passwords -- Passwords can be designated for files as well as user numbers. The originator can change the file password at any time and imbed nonprinting characters for additional security.

-   Binary files -- For highly sensitive data, files can be stored in binary form, programs in compiled form.

-   Chain and compile safeguards -- The user cannot chain from one program to another if the first is not saved; this protects him from

inadvertently destroying the original program. Similarly, a program

cannot be compiled unless it is first saved.

- Journalization -- This enables the user to back up selected files

on magnetic tape and automatically recover their contents in the event

of a mechanical failure or inadvertent damage to data. Journalization

is particularly useful for users with highly active, transaction-

oriented applications.

● In addition to the security features just described, GE optionally

offers a set of administrative controls that permit companies to manage

and operate their own network service. One administrative user may be

designated per catalog. He may create new user numbers, change passwords,

monitor current usage, define the conditions of use within his catalog, and

obtain usage and billing information as needed.

CROSS INDUSTRY PACKAGES

GE offers subscribers a library of over 600 programs. Major ones

include AUTOFILE, FAL II, FLEXIMIS, AUTOTAB, PA300, STATSYSTEM, DMS, an

integrated accounting system, a set of numerical control programs, and a

series of inventory control programs.

● FAL II, a financial analysis language, has been available for four years

and has about 800 to 900 users.

● FAL II allows financial analysts and planners to design reports and

analyses to their own specifications and business formats. It is useful

for applications ranging in complexity from "one-time" financial analyses

to multi-locational, sophisticated management reporting systems.

- FAL II offers extensive report formatting and editing options. Logic design streamlines establishment of models. Capacity is big enough to handle large management reporting systems, complex financial calculations, and sophisticated business models. Built-in capabilities cut time and effort for calculating depreciation, present value, ROI, amortization schedules, rolling forecasts, and consolidations.

- FAL II is designed to avoid inflexibility inherent in typical "canned" programs, permits easy linkage to other programs, data files, and application packages for an integrated system.

- FAL II streamlines definition of logic and report formats as well as input and storage of data. Easy to learn; can be implemented with little training or delay.

- FAL II provides fast implementation and low starting costs. Ability to save the bulk of computations in model definition means time and usage savings for subsequent runs.

- FAL II offers 36 report formatting options, 9 column editing features, and 15 row editing options for variety in management reports plus wide choice on titles, columnization, headings, spacing, paging, and report size. "Double precision" option is included. Data file capability permits storage and comparison of information. Users can insert alpha characters through report body. Additional features include functions for rounding and random number generation, automatic printing of repetitive characters (dollar and percent signs),

model definition, file editing, and built-in diagnostics. Users are
not locked in with typical formatting restrictions; can print out rows
and columns in a variety of orders and sequences.

● DMS Data Management System has been available four years and has
about 900 users.

● DMS is a data base manager and useful for applications such as
personnel management, project control, purchase order tracking, marketing
and sales analysis, accounts receivable/payable status, financial
reporting, inventory control, budget control/analysis, and many others.

- DMS produces complex formatted reports quickly. Automatically
creates files needed to store and manage the data base. Structures
data by key fields to permit fast retrieval for ad-hoc, production,
and standard reports.

- DMS utilizes hierarchical storage techniques. Allows user to
save the loaded version of retrieval requests, thus cutting time and
costs on production reports.

- DMS processes update transactions, adding new records, deleting
old ones, modifying existing data. Sequential processing is not
required and only changed/new data need be entered.

- DMS permits use of simple English-like statements so users
need not be computer experts.

● DMS can interface with other GE packages such as Financial Analysis
Language (FAL II) or with the user's other programs. Handles large

quantities of data, automatically creating necessary file space, using multiple files, and maintaining them in proper order. Can access multiple data bases using cross-reference keys to tie them all together. Wide choice of formatting options include variety on titles, headings, spacing, paging, and report size. "Double precision" option allows 16 digits of accuracy (particularly useful when interfacing with other programs).

● STATSYSTEM has been in commercial use over five years and has over 1,500 users.

● STATSYSTEM is a statistical analysis system that helps business people to master numbers and their relationships for meaningful decision making.

● STATSYSTEM is a tool for any business activity where volumes of data must be reduced to concise amounts of information...where statistical distributions are used to model data and produce possible outcomes and their probabilities...where time series data must be forecast...where relationships must be established between observed response and factors affecting the response.

● Areas of application for STATSYSTEM include these:

- Business Management--To evaluate and forecast growth on existing sales, population, and economic data.
- Marketing--To analyze and evaluate market research data and study product performance.
- Manufacturing--To specify requirements based on analysis of production data, inventory data, quality control data.

-    Engineering--To evaluate test data and model system performance.

• STATSYSTEM may be used in conjunction with other features of GE's MARK III Service -- financial analysis language, data management system, plotting capabilities, etc. -- for an integrated approach to business management.

• STATSYSTEM offers full analysis capability for handling standard and summary statistics, simple regression (six curve types), multiple regression (including correlation analysis, step-wise multiple regression, polynomial curve fitting, analysis of variance, exponential smoothing, reliability analysis, T-statistics, chi-square, confidence limits, and others. Exponentially smoothing routines allow for base series adjustments and cyclic analysis. Large capacity can contain 4,000 data items with a maximum of 35 variables; and users may identify the variables with alpha-numeric names for easier identification. Data can be selectively read from any number of ASCII files into STATSYSTEM's core resident data base, or an entire file of binary data can be placed into STATSYSTEM's data base. Conversely, all data contained in STATSYSTEM's data base including modifications and transformations can be written to ASCII or binary files for future use.

• A computer software system called STATPAC, developed for company-wide use in business analysis, introduced by General Electric Co. in 1973. Developed at the GE Research and Development Center in Schenectady, N.Y., the package is designed for remote batch operations on the Honeywell 600 and 6000 series of computers. In one GE application--the checking of heavy

rotating equipment, test engineers formerly had to plot manually the stresses of every unit in service, which cost $800. According to GE, Statpac now accomplishes the same task for $5 in computer time costs.

● AUTOFILE allows businessmen to maintain files and create management reports. (This program is proprietary to Capex Corporation of Phoenix, AZ, and a royalty fee is charged for its use.)

● FLEXIMIS is a management information system that maintains and retrieves data from large data bases and performs exception reporting.

● AUTOTAB helps the user prepare formatted tables from relatively small data bases, for such applications as budget preparation, financial projections, and sales analyses. It is supplemented by MINITAB, a junior version of AUTOTAB, and by AUTOGRAPH, a program to produce graphs and bar charts. (These programs are proprietary to Capex Corporation and carry a royalty charge.)

● PA300 is a probability analysis system that evaluates alternatives, weighs risks and analyzes parameters, to assist managers in making decisions. (This program was developed by GE Engineering Consulting Service in Schenectady, New York, and carries a royalty charge.)

● The integrated accounting system consists of four program packages: GFAST$ for general ledger accounting; GEPAY$ for payroll preparation; LABOR$ for auditing of labor distribution; and CKREC$ for check reconciliation. These packages can be used individually or on an integrated basis.

● The integrated control system consists of NCPPL$, for point-to-point and multi-axis contouring; ADAPT, and APT-compatible language for 2-½-axis contouring and 3-axis linear work; generalized or specialized Post-processors to handle all types of equipment; and tape verification programs to check program correctness and tape accuracy.

● Inventory control programs available include $GIVY^2$, a generalized order processing and finished inventory control system; $GIVY^3$, an order and inventory status system used in conjunction with $GIVY^2$, STORES, a condensed version of $GIVY^2$ that does not perform order processing; PBREK$, a program that analyzes order quantities where price-break discounts are invovled; SEUST$, a program that determines optimum stock-order levels based on storage space available; NWSIS$, an inventory simulator used to analyze ordering lead times and customer demand patterns; MIEOQ$, to determine economic order quantity; and other special-purpose programs.

Other programs in GE's library cover the following areas:

● Business Management--critical path scheduling; forecasting; business analysis including budget preparation, long-range forecasts, investment requirements.

● Financial Analysis--capital investment analysis; investment management including cash flow impacts and present and future value of stocks; historical and projected financial statements (FINEX$).

● Civil Engineering--coordinate geometry system (COGO); box and circular culvert analysis; cut and fill; soil stability; rigid frame, truss, and

continuous girder analysis; retaining wall analysis, hydraulic network analysis; concrete column and flat plate analysis; wind stress; air duct design; lighting system design; beam and column properties (AISC tables).

- Electrical Engineering--ac and dc circuit analysis (including ECAP), digital and analog simulation, linear systems analysis, stub matching, linear antenna arrays, load flow studies, fault analysis, dynamic system simulation.

- Mechanical Engineering--steam and water properties (1967 ASME), vibration analysis, finite element stress analysis, generalized area and moment of inertia calculations, heat exchanger design, stress and deflection of bodies (using thin shells of revolution approach), structural engineering solver (STRESS).

- Mathematics--functions (double precision and complex), least squares and minimum/maximum fits for curves with linear parameters, least squares fits for curves with nonlinear parameters (Marquardt algorithm), Fourier analysis, solutions of linear systems, eigenvalue-eignvector computations, matrix operations, optimization, linear programming, integer programming, differential equations, numerical integration and differentiation, polynomials (zeros, evaluation, construction), interval arithmetic, matrix inversion, plotting, geometry, zero of a function, solution of nonlinear systems.

- Statistics--regression analysis, correlation, chi square, analysis of variance, univariate statistical analysis, confidence limits, hypothesis

testing, random numbers (uniform, nomral, exponential, Poison, Erlangian),
integrals and fractiles of probability density functions, error and worst-
case analysis of models.

●   Manufacturing—a set of 26 programs used for production control,
numerical control, quality control, inventory control, and industrial
engineering.

●   Utilities—SORT/MERGE, for sorting and merging background data files;
DATOOL, a data base management system; index sequential file handling
programs; bulk media conversion for Background users; system routines for
string manipulation, character conversion and manipulation, bit manipula-
tion, I/O functions, sleep/wake capability, journalization, file sharing,
and various other functions.

Besides its own program library, GE offers subscribers access to a
eries of Network Software Services (NSS) packages, which are privately
developed and marketed. These programs are available through third-party
agreements with the authors, and a royalty fee is charged for their use.

Some of the NSS programs are accessible to all MARK III Foreground
users through GE's library. Besides AUTOFILE, AUTOTAB, MINI-TAB, AUTO-
GRAPH, and PA300 which were described previously, these include NGPAK*H,
a chemical/petrochemical engineering program for K&H flash calculations,
developed by the Natural Gas Processors Association (Tulsa, Oklahoma);
and a software support package for the GE-PAC 30 process computer, supplied
by GE Engineering Consulting Service (Schenectady, New York).

Other NSS programs are available to GE users through the software author's commercial library. These programs cover the following areas: real estate, cost analysis, insurance, income tax computation, financial analysis, project management, inventory control, numerical control, metalworking, electric utility, structural and civil engineering, power systems, optical system design, decision analysis and modeling, resource allocation, terminal software, petroleum evaluation, and sheet-metal estimating.

NETWORK SOFTWARE SERVICES

• Businessmen can use available software systems unique to their

industries or disciplines. Written by business and professional people

for their own use, such systems are offered by these authors, for royalties,

to other businessmen with similar needs. These systems or programs have

particular advantages: they reflect knowledge and expertise of industry

experts, they are accessible on-line through GE's worldwide MARK III

Information Services Network, and they are available to users without

incurring development costs and at costs based on usage rather than

"purchase of a package".

• This feature of GE's MARK III Service is called Network Software

Services. A potential user reaches an agreement directly with the software

author for use of the system or program. A user must execute GE's standard

contract for use of GE information services if he is not already a GE

customer. Once the user is validated by GE, he may use the software at

any time. At month end, the user gets one bill covering the cost of using

the system plus the author's premium.

• Network Software Services applications are supported by author docu-

mentation, training, and technical support. GE will provide general

training sessions in efficient use of the MARK III Service.

NSS PROGRAM INDEX

• This index lists nearly 200 systems and programs from over 50 NSS

authors. Each system and program is listed under the application area

INDEX TO AUTHOR COMPANIES

selected by the author, and cross-referenced under a secondary area.
Each explanation and contact is essentially as furnished by the author.

●   MARK III Service users may secure new and revised information updating
this index on-line, by listing from their user numbers DSSL:NSSLIB.

●   Unless otherwise indicated, General Electric has no responsibility
for the programs in the index. The programs are accessible on an as is
basis through General Electric's MARK III Service. There are no warranties,
including but not limited to, any warranty of merchantability or fitness
for use for a particular purpose.

INDUSTRY ORIENTED PACKAGES

Electric Utility Packages

● Utilities have found that MARK III Service's network provides them with access from dispersed locations to the Electric Utility Systems Engineering Department programs and updates with new features. Thus, the utility is spared the development efforts, and is the recipient of "state-of-the-art" technology. Parallel availability of old and new programs assures utilities of a smooth transition as one program is phased out and another brought on stream. Network availability permits a utility to try a particular program to test its suitability-without the capital expense of developing and implementing a new program or system. For complex programs and system analyses, EUSED specialists are available to provide the necessary training and consultation with utility personnel to insure smooth start-up and the many programs EUSED has available on MARK III Service along with others that will be available shortly.

● The first programs described deal with generation expansion planning. They evaluate generation system reliability, compute production expense and optimize generation mix. The next program, Financial Analysis, can be used to evaluate generation expansion plans and other decisions effecting a utility's financial statements. The last group of programs is concerned with transmission planning. These include long range planning programs, load flow and stability programs, a program for transmission line design and programs for reliability evaluations.

Single Area Reliability

The single Area Reliability Program (SAR) computes the probability of
loss load due to inadequate installed generating capacity and adds
generation in the event that an adequate level of reliability is not met.
This is a very detailed MARK III Background Service program capable of
using frequency and duration measures of system reliability. Measures
to assess generation system reliability are based upon unit size, planned
and forced outage rate, system size, load growth and load forecast uncertainty.
A recent program improvement determines the frequency of emergency actions
such as outside purchases, voltage reduction and, ultimately, customer
disconnections. Analyses may be made for a 30 year time period for systems
of up to 600 units.

Incurred Operating Expenses Determined by Simulation Program

The Monthly Production Simulation (MPS) program gives electric utilities
the ability to quickly and efficiently simulate hour-by-hour operation of a
power generation system on a deterministic or stochastic basis in order
to determine the incurred operating expenses. System operation and cost
may be studied under a variety of planning alternatives and operating
policies. Costs are summarized on a monthly and annual basis. Present-
worth techniques combine the annual results to obtain a single cost
figure for each plan under study. MPS is accesxed through MARK III
Foreground Service, and execution takes place in Background, providing users
with the flexibility of interative I/O processing plus the economy of
batch operations.

• MPS was developed by EUSED to serve the needs of the electric utilities in three particular areas of application: Long-Range Generation Planning, Financial Planning and Fuel Budget Preparation.

• Three Interactive Software Packages For Electric Utility Generation planning and reliability evaluation are available on General Electric's Mark III information services network. The Optimized Generation Planning (OGP) program optimally formulates a 20 year extension of electric utility generation systems. It gives utilities an integration of generation planning techniques designed to develop the expansion by considering various alternative forms of generation to minimize 20 year present worth cost.

• A second generation planning package allows electric utilities to evaluate alternate generation patterns using four programs in GE's MARK III software library. These programs model loads, compute generation expansion probabilties and determine production and investment costs. Using the package to simulate future operating characteristics, GE said users can obtain a dollar evaluation of turbine-generator forced outage and heat rate differences. Simulation techniques can also reveal the most efficient type of operation based on unit fuel and plant costs, heat rates and system load characteristics.

o Two interactive programs are available for reliability evaluation of electric power networks. One program performs a failure mode and effect analysis (FMEA) which identifies all single and double component outage conditions. The second program computes frequency and duration reliability indices for the network using the results of the first program as input.

INPUT

These programs were developed and authored by GE's Electric Utility Engineering Operation in Schenectady, N. Y., which also provides technical support for the packages.

- SURGE, a new program developed by General Electric Co.'s Electric Utility Systems Engineering Department (EUSED) is designed to assist electric utilities in calculating the probability of flashover due to switching surges on overhead transmission lines. The language for this program is Fortran IV, and it can be accessed on the GE Mark III timesharing system.

- The program makes extensive use of statistics to optimize transmission line tower designs. Statistical representation of weather, switching surge, and breakdown voltage are used to arrive at a probability of flashover on the transmission line. The use of this program permits the user to design transmission line structures on a probablistic basis. This is in contrast to the more conservative withstand concept which results in a worst case design.

- This program is part of General Electric's overall METIFOR approach to line management.

- There are a number of input options which permit the user either to use a set of standard relationships programmed into SURGE or to reject these inputs in favor of others more suitable for the problem. The various statistics required by the program can either be assumed by the user or are available through arrangements with the Electric Utility Systems Engineering Department.

Simulation Techniques Analyze Most Efficient Types of Operation

● Electric utility users can efficiently evaluate alternate generation patterns with a package of four programs EUSED makes available on MARK III Foreground Service. LOADS develops load models, PROBS computes generation system reliability, HPROD simulates system operation to determine production costs and ICOST evaluates investment costs. By using the package to simulate future operating characteristics, utilities can obtain a dollar evaluation of unit forced outage and heat rate differences. Simulation techniques also reveal the most efficient type of operation based on unit fuel and plant costs, heat rates and system load characteristics. The answer to numerous questions can be addressed: peaking versus base load capacity; impact of schedule slippages; system reliability criteria and the value of energy purchase/sales contracts, just to name a few.

● These comprehensive generation planning programs provide many answers normally available only through large-scale batch programs. However with these programs offered on MARK III Foreground, users retain the flexibility and prompt turnaround of interactive processing.

Financial Analysis

● Historically, system expansion planning decisions were based largely on minimizing the present worth of annual costs. In the Second Electrical Century, however, analyses must evaluate many more alternatives and complex financial considerations. A computerized Financial Model Program, developed by EUSED for electric utilities and available via MARK III Foreground Service, makes it possible to forecast the impact of a proposed financial decision on

a utility's future financial position. The program permits analysis of investment allocation, depreciation planning, expansion planning, retirement planning, cash management, new taxes, along with other numerous variables that will affect a utility's financial standing. Access to a financial model such as this can be a tremendous asset to managerial decision-making in a what-if environment. For example, one investor owned utility uses this program to evaluate the financial effects of projected fuel costs.

Transmission Planning Program

● The Transmission Planning Program (TP-3) formulates a 20 year expansion of a bulk power transmission network for an electric utility. It gives the utility a fast look at many different transmission expansion plans with minimum effort. By combining a horizon year plan with linear programming methods, year-by-year transmission plans are developed with the object of minimizing costs. Right-of-ways and voltage levels can be optimized for various generation unit siting plans. This is a large-scale batch program available on MARK III Background Service, with output available on remote terminals or by mail.

● EUSED's Transmission Planning Program has had many applications within the utility industry. For example, one customer used this program to compare transmission costs for dispersed generation plant sites and large nuclear generation parks. Another utility used the program as a guide to selecting when and where to introduce a higher voltage.

- Initial conditions for a stability calculation are taken from a converged load flow solution file prepared by a load flow execution. These are combined with dynamic model data supplied separately to the stability program, covering such additional parameters as generator, exciter, and prime mover dynamics; relay operating characteristics; and others.

Power Systems Planning: Load Flow, Stability and Fault Studies

- Systems of smaller size may be readily studied through a MARK III Foreground Load Flow program which provides for the analysis of power systems containing up to 50 buses, any of which can be load, generator or swing buses. The program provides for optional printing of input and selected output.

- Using input from the Load Flow program, the system's Fault program makes three-phase or single-phase fault calculations for systems of up to 50 buses in size.

- The Stability Program obtains base case system data from a Load Flow program solution. With a 50 bus maximum limitation, the solution procedure is generally to advance the system dynamic equations in time through an approximately second-order integration process. Accelerated Gauss-Seidel nodal admittance iterations are used to solve the network flow at each step of the time variation.

Environmental Considerations Analyzed In Transmission Line Design Package

- Planned additions to programs available via MARK III Service include

a transmission line design program package(TRENDS) for environmental analyses involving radio noise, audible noise, corona, conductor surface gradients and electric field profiles. In addition, an electromagnetic and electrostatic transmission line parameters program calculates the electrical characteristics of a system of overhead conductors for either EHV or UHV A.C. lines as well as overhead D.C. transmission lines. Additionally, EUSED plans to have METIFOR available on the MARK III Foreground Service. METIFOR is an A.C. transmission line program for line insulation design based on weather statistics, switching surges and line stresses. Both of these programs are scheduled to be available by the second quarter of this year.

● TRENDS is designed to handle one or two circuit EHV or UHV transmission lines. This interactive Foreground package runs from an executive module which permits running any of the environmental programs in any order. Input can be either Metric or English units.

● Knowledge of the electrical characteristics of a system overhead conductors can facilitate the solution to many problems arising within the electric power industry. The electromagnetic and electrostatic line parameters program provides for maximum flexibility in handling odd or non-standard systems of phase conductor configurations and tower geometrics. Electrical parameters are given for each physical conductor, equivalent phase conductor and, where appropriate, in terms of symmetrical components.

Power Systems-Load Flow

Load Flow programs for the efficient study of large scale networks provide system level load flow studies, complete with major apparatus representations and automatic control functions. EUSED's Load Flow programs model the power system's apparatus, including: generators, AC lines with charting current, DC lines, transformers and regulators, phase shifters, bus capacitors and reactors, and series capacitors. The programs also model system operating conditions, including interchange areas and control, load zones within area, automatic voltage and reactive flow control by transformers, and automatic power flow control by phase shifters. The programs feature base case and change case capability, alphanumeric bus identification, and Newton-Raphson solution.

SURGE Power Systems-Transient Stability

● The transient stability program is designed to show the principal features of dynamic performance of a power system on a time scale with minimum resolution of the order of one cycle, and covering a period of usually from about 60 cycles to 300 cycles depending on the situation being studied. The solution period is taken at least long enough to check for first-swing stability. Examples include, effects of machine rotor electrical transients, automatic configuration changes, and series capacitor gap arc-over. For periods extending beyond the first swing, the program considers additional factors, such as voltage regulators and prime mover dynamics, line reclosing operations, and effects of system frequency on loads, including underfrequency load shedding by relay action.

Reliability Analysis: Evaluation of Electrical Networks

● A package consiting of two interactive programs is available to electric utilities for reliability evaluation of electric power networks. One program, FAILURE, performs a failure-mode-and-effect analysis which identifies all single and double component outage conditions. The second program, COMPUTE, computes frequency and duration reliability indices for the network using, as input, the results of the first program. These two programs are ideal tools for reliability analysis of sub-station arrangements.

● The FAILURE/COMPUTE programs were recently used by an eastern utility to choose optimum circuit breaker configurations on a new standard sub-station design. They were also utilized by a major utility in the southwest to decide between several breaker configurations to serve a large industrial customer. Since these programs are available on MARK III Foreground Service, electric utility users gain the added benefit of flexibility and quick turn-around.

Reliability Analysis: Evaluation For Generator Step-Up Transformers

● A second package comprised of three programs is available via the MARK III Foreground Service for evaluation of generator step-up transformer alternates. Each of the three programs focuses on a particular application. One program, STEP-UP, permits economic comparison of various transformer and spare alternates for a single power station with 1 to 4 generating units. For example, a large southern utility utilized the STEP-UP program to examine the economic advantage of four single-phase transformers over a

single, three-phase unit. Another southern utility used STEP-UP
to evaluate various dual three-phase transformers for a new nuclear
power plant.

●   The second program, SPARE, permits evaluation of the economics of
a system (or pool) spare step-up unit to support several generating
units at different stations. This program has been used by a midwestern
utility to investigate the economics of a second system spare to support
several generating units. INPLACE, the third program, evaluates the
economics of installing additional bus connections to a single-phase
spare to permit connection of a spare transformer without physical move-
ment. INPLACE has been used by two eastern utilities to prove economics
of removable bus duct lines to allow rapid connection of a space transformer.

●   The significant feature of these programs is that they include costs
arising from possible transformer forced outages. For large, efficient
generating units, forced outage costs may be very significant; and for
typical units, the capitalized forced outage cost may exceed the combined
transformer purchase price and loss evaluation.

●   Data base for analysis of electricity consumption–a data service
which can be used to analyze factors affecting regional and national electric
energy consumption is available from General Electric Co. Analysts,
planners, and economists in utilities, manufacturing companies, financial
institutions, universities and government agencies concerned with
forecasting electricity.demand can gain access to Electricity Consumption
Analysis Data (ECAD) via GE's MAP Service on the Mark III Information
Services Network, GE said.

INPUT

- ECAD contains monthly data since January 1971 on four electric utility operation variables for five customer sectors, and 11 correlated weather and economic variables for 63 utilities, providing a total of more than 1900 time series. The 63-utility sample constitutes two-thirds of U.S. kilowatthour consumption and has been selected to reflect a variety of system operation conditions in all nine U.S. census regions, facilitating cross-sectional, as well as time-series analyses, GE said.

- ECAD data can be combined with other economic industrial, marketing and financial data banks and extensive analytic tools in the GE MAP Service, in addition to the user's own data files, the company said, and the Center for Energy Systems will periodically update ECAD from original sources as the data becomes available.

- A rate structure analysis program for use by electric and gas utilities has been announced by General Electric's MARK III Information Services. Called Newrates, the program enables a utility to examine the changes in revenue realized, throughout various class rates, when the structure of a rate class is altered. Based on this analysis, GE said, utilities can more promptly submit rate increase request to regulatory commissions for review. Developed by a midwestern utility, Newrates is currently available on GE's MARK III teleprocessing network.

- The interactive program can produce an analysis containing "what if" contingencies, which GE said enables the establishment of a rate structure that is equitable and yields the revenue needed by the utility. Newrates can evaluate rate of return on investment, for use by utility market forecasters.

● Comprehensive data is produced by comparing billing via a present rate schedule with a proposed rate schedule. Comparisons are made on base rate billing as well as gross billing, and all steps in between. Factors that can be calculated for each customer include fuel adjustment cost for electric utility customers, purchase gas adjustment for gas utility customers, state taxes, local taxes, rate ratcheting, and summer/winter rate provisions.

Manufacturing

● An on-line order service/inventory control capability is available on the Mark III time-sharing network.

The capability, call order service program generates, produces programs that handle order entry cycles and control stock allocations and back order procedures.

Features of the programs include on-line reports that keep sales representatives informed of order status: operating documents, including order acknowledgements, ship sets, bills of lading, invoices, inventory listings, backlogs, back orders and re-orders; audit trail data; and management control information, according to a spokesman.

The system can be accessed through a variety of terminals.

Petroleum Industry Programs

The scope of the resources offered the petroleum industry through MARK III Service is extensive. These features, which have provided 2 million user hours to some of the most demanding customers in the world include:

- <u>Network Software Services</u> (NSS) is a vehicle whereby software authors
  with highly developed expertise in business and industry areas make
  their programs available through the MARK III Service. These
  programs are maintained, documented and supported by the authors
  on the MARK III System.

- <u>Applications Program Library</u> is a collection of several hundred
  packages covering a broad range of disciplines. They are prepared
  for the user who, in many instances, seeks a stand-alone high level
  sub-routine for a unique application being developed for his needs.
  These library programs are designed to meet either or both needs.

- <u>Petroleum Company Developed Programs</u> have usually been developed for a
  company's specific needs and are made available, at its discretion,
  for use on the MARK III System by other companies with similar
  application needs.

- <u>Information Services Business Division</u> through its Custom Applications
  Division, provides services for the design and development of
  customized programs to meet a user's specific needs.

PETROLEUM DATA SYSTEM SUMMARY

The Petroleum Data System is a searchable, computerized data base containing publicly available information for all oil and gas fields and pools in the United States and Canada. The PDS file was constructed by the University of Oklahoma, Office of Research Administration through a contract with the U.S. Geological Survey and is currently in its seventh year. The PDS was recently made available to the public through the Freedom of Information Act.

The PDS contains information on approximately 70,000 oil and gas pool records. The file deals with the aggregated field totals, not individual wells in the fields, with the exception of discovery well data. The information in the file includes the official name of the field or pool and its location by county; size; cumulative and annual production of oil and gas; geologic occurrence with respect to discovery well, type of entrapment, and age of reservoir, engineering data on reservoir temperature, pressure, and petrophysics; and analysis of crude oil, brine, and natural gas. All geologic basins carry the same name and code as the American Association of Petroleum Geologists Committee on the Statistics of Drilling. Each reservoir includes the USGS formation name and era-system-series designation, which also are encoded. Each field is assigned a Federal Commission field code, and each state and county the FIPS code.

The basic data sources are the reports of the several state regulatory agencies and geological surveys of the oil and gas producing states. Data from within the Federal Government is derived principally from the Bureau of Mines, U.S. Geological Survey, and Federal Power Commission. Significant amounts of information in the file are

prepared on a continuing basis by the International Oil Scouts
Association, and released to the U. S. Geological Survey through a
cooperative agreement. In addition, the IOSA is making available
to the file the historical production and well count information
from each field, back to 1942, compiled for a special study being
prepared for the Federal Energy Administration by the USGS.

Additional data in the United States and Canada have been, and
are continuing to be added to the file through a grant awarded to
the AAPG by the USGS. A large number of AAPG volunteer workers
throughout the United States are checking and updating the field
data already in the PDS file, and are adding geologic data including
geological basin, geologic age of producing formation, age of oldest
formation penetrated, reservoir lithology, porosity (where available),
and type of trap. Information concerning reservoir temperature, initial
shut-in pressure, and sulfur content of the crude oil are added where
available.

CONTENTS

[handwritten notes:] Bob will get original xeroxed

o ther Programs available to the petroleum industry are grouped in the following categories

INDEX TO PROGRAMS AND ROUTINES

Banking & Finance

● First Wisconsin has automated the accounting and reporting system of its London branch utilizing General Electric's MARK III computer network. The Milwaukee main office receives full reports about the branch's position and activities every noon-including foreign exchange profit and loss, financial statements, maturity schedules and credit limits control.

● Network Approach Attractive - The computer network approach seemed to combine several attractive features. It involved the installation of remote terminals at the London branch to input raw data to GE's Information Services network. In this approach the main office would have as much access as the branch to the data files and technical service of the system could be achieved from Milwaukee.

● Each day at 11 a.m. Milwaukee time, the London branch closes. Then the main office accesses the network to receive all managerial reports for the day, including a position for each one of the currencies the branch is active in, the foreign exchange profit or loss for the day and a full financial statement.

● On the operational side, confirmations, paying and receiving instructions and ledger cards, among others, are also important output to the branch. Other reports that are available on demand by either the brnach or the main office give the degree of detail necessary to satisfy most inquiries.

● The Bank spends $8.5K per month with GE for this application. Man-

agement believes that in one or two years they may get a mini in London
and rent time on a satellite to do the same application at half the
price.

● Chemical Bank's solution to the problems of helping customers deal
with foreign exchange exposure protection lies in a unique system which
enables a money manager to reduce the major risks which currency fluctua-
tions pose to doing business overseas. Called the Foregin Exchange
Advisory Service, the system employs MARK III Service extensively, and
is one of two offerings of the bank which are being enthusiastically
received by business managers around the world.

● Businessmen need a financial oracle–to track all exposure, all of a
company's positions and options, and all of the interrelationships among
the revelant currencies. And reports, Chembank's Foreign Exchange
Advisory Service does all that and more.

● The heart of the system is a highly sophisticated but, easy-to-use
computer model called STRATSIM* (strategy simulator). It was developed
by Chemical Bank and is available world-wide on the MARK III teleprocessing
network.

How It Works

● The system requires only a user company's exposure data, including
effective tax rates, borrowing costs and outstanding foreign exchange
contracts, and the Chemical Bank currency projections. Those projections
include short, medium and long-term views and allow user evaluation of any

*STRATSIM, ALTDET and CHEMLINK are service marks of Chemical Bank.

combination of optimistic and pessimistic projections for any time period.

- In a matter of minutes, STRATSIM permits the corporate treasurer to determine what he can expect to gain or lose, currency by currency. He can see the associated risks and major problem areas, and then simulate protective strategies using forward markets, borrowing or investing alternatives, leads and lags and other options to find the best strategy for maximum protection.

- Users of the service-50% of which are companies with annual sales of more than $1 billion-are assured confidentiality of their corporate data, as no one at Chemical ever has access to the information employed at STRATSIM.

- For multinational corporations with more extensive requirements, Chemical has also developed an information system which provides daily, weekly, and monthly analyses of the foreign exchange markets and currency outlook. Another analytical model called ALTDET (alternative debt evaluator), evaluates long-term borrowing alternatives for any number of currencies and time periods.

- In spite of the complexity of the supporting computer programs employed by STRATSIM and ALTDET, each user has learned the simple basics of its operations during a two-day workshop.

Unique Cash Management

- From the bank's Financial Systems Department comes a new cash management system called CHEMLINK, which provides corporate treasurers and cash managers with fingertip information which directly supports daily operations through timely reporting of account balances and other important data.

● The information can include both Chemical and non-Chemical bank accounts, and, any desired balance-related information, including moving averages, deposits and withdrawals for operating units and banks at any location. The reporting format is quite flexible and can be tailored to meet each company's needs.

● Among the many advantages of CHEMLINK:

- It provides the corporate treasurer with a timely and accurate update of his overall cash position, covering decentralized banks and divisions, including overseas locations.

- The combination of simple, accurate data capture and flexible reporting built into CHEMLINK enables corporate headquarters to effectively monitor and enforce decentalized divisional cash managers' compliance with operating procedures.

- The data capture ability includes international account information virtually around the clock.

- Because they system utilizes GE's MARK III Service, it not only gathers and reports cash management data, but also has modeling and action and control reporting features which enable the cash manager to plan, implement and monitor his decisions from his office terminal.

- Security and confidentiality are built in. Only the user can specify who in his organization can access the information and each remote terminal can only input data.

- Costs involved are directly related to the amount of computer time used, CHEMLINK is economical for small as well as large organizations.

- Commercially available since October 1975, CHEMLINK has received an "extremely good" response from the bank's customers. "We are the only bank which offers customers single terminal other-bank reporting, payment order service, short-term rates, and, soon, same-day 'lock-box' reporting (remittance banking) and same-day credits and debits.

- "In effect, CHEMLINK is a direct linkage between the corporate treasurers office and his banking accounts and system of relationships."

- General Electric Co.'s Information Services Division has available a Securities Database System on its worldwide MARK III Service remote computing network.

- The package combines upwards of 80 items of information on each of some 28,000 securities with a set of retrieval and reporting tools. The database includes common and preferred stocks; corporate, municipal dollar and government bonds; stock options; mutual funds; and foreign issues traded on the major U.S. and Canadian exchanges and over-the-counter. The database is updated nightly with daily securities data supplied by Telstat Systems Inc. A minimum of 10 trading days and 53 weeks of pricing data is retained in the Securities Database System. It also includes up to two years of time-series information on earnings, dividends, interest payments and special distributions.

- The database is directly compatible with the MARK III Service's Data Management System (DMS), FAL II, STATSYSTEM, and PLOT. In addition, special programs and subroutines are available for retrieving the latest information

for any security and to compare the current market value of a
portfolio against its original cost.

●   The Securities Database System is designed to assist bank trust
departments, insurance companies, investment management services, brokerage
firms, corporate investment operations and CPA firms in applications
sucy as portfolio valuation, performance measurement, investment research,
collateral loan monitoring, pension accounting and securities tax analysis.

Transportation

●   The Carribean and Central and South America Norsk Pacific Steamship
Co. Ltd. uses General Eelectric's MARK III network to create a projected
profit and loss statement for every voyage it makes.

●   In addition, the system permits Norsk Pacific to update shipping
schedules instantaneously to measure performance by capturing and analyzing
costs and to control receivables, payables and billing with greater
efficiency.

●   Conceptually, the system is two-sided, consisting of a data base
capturing all the relevant information connected with every voyage and a
package of programs which projects the cost of a voyage based on the
expenses of similar trips in the past.

●   Because Norsk Pacific runs relatively small ships, the firm has to
be particularly conscious of variable costs, therefore, the data base
includes such information as the productivity of the cranes which pick
up tonnage and load it on the ship and the total time stevedores spend
working on the vessel.

- In addition, to these "costs to the cargo," the system also captures such "costs to the ship" as port-of-call expenses for the facilities and services used while the vessel is in a harbor, fuel oil costs and crew wages.

- With this data base, Norsk Pacific analyzes the costs and productivity levels achieved in any voyage and isolate trends among these variables.

   The company can take this historical information and then project the economics involved in any future trip. This part of the system is the "proforma voyage analysis."

- Marine Management Systems, Inc. (MMS), a Connecticut-based firm specializing in computerized management systems for the international marine transportation industry, the necessary software was developed by MMS.

Hospitals

- Hospital Corporation of America and General Electric Information Services have developed a new data processing system which is unique in the industry.

- The program, to be performed on General Electric's MARK III remote computing service, handles all financial accounting and corporate management reporting for hospitals operated by HCA.

- A data processing system operating on GE's MARK III service, the new system includes a quantitative management information reporting system developed by HCA to meet the informational requirements of its corporate

divisional, and hospital management, and a series of hospital applications such as patient billing, general ledger, accounts receivable, payroll etc., which were developed jointly by HCA and GE to meet the financial requirements of HCA hospitals.

• In each hospital, GE Terminet data terminals provide data input and output. The system is used to capture all patient charges, maintain accounts receivable, record payroll, provide paychecks and receive many and varied financial reports for use by all levels of management personnel.

• HCA has implemented the new system in essentially all owned hospitals, and is offering the applications to all facilities operated under management contract.

• HCA currently operates 69 hospitals in 1976 with more than 10,000 beds located throughout the Southeast and West Coast areas, and has a number of other facilties under construction. The Company had total revenues of more than $297 million in 1976.

Interactive Business Graphics

• An interactive business graphics package on its time-sharing network was introduced in 1976.

• The package, called PLOT, allows users to display data in graphic form, according to a spokesman.

• The software can generate a variety of plots, including line

graphics, bar graphs, and scatter diagrams, it was noted. It is designed to run on most character printers.

● One to five plots per page can be printed, and the user can vary the plot length and width, and specify page titles.

● The package does not require familiarity with a programming language. It can be used as a stand-alone program or interface with FAL II, GE's financial analysis package.

Collection & Management of Critical Business Data Helped By the Use of TIP (Telephone Information Processing

● Telephone Information Processing (TIP) can transform any telephone into an inexpensive computer terminal. Designed to gather small amounts of critical business data from widely scattered locations, TIP is fast and uncomplicated. It can be used by restaurant managers, bank executives, and others to enter information to General Electric's MARK III Service by pressing the keys of a telephone.

● An oil company in the sourthwest is using TIP as a means of having their service stations report the gallons/price/grade of gasoline sold. With instant access to these figures the company is better able to perform their sales and marketing analysis.

● A real estate appraisal firm in the Mid-west computes mortgage analysis right from the client's office by inputting the data to be computed against the "Elwood Tables for Real Estate Appraising" via the GE service.

- A regional fast-food chain in the northeast is now using TIP for their cash consolidation. The various outlets in the chain enter their sales data into MARK III's network via TIP at the end of each day. Because of the timeliness of this method, financial information is processed that much sooner giving the company's management a clearer picture of the day-to-day profitability of the business.

- The key elements that make TIP useful in all these applications is the need for time-critical data to be gathered from, or transmitted to, dispersed locations; a relatively small amount of data with phone sessions lasting only a few minutes; and data that is principally numeric in nature in an operation this is repetitive on a daily or weekly basis. Under these conditions, TIP lends itself quite well to applications such as order porcessing, cash consolidation and operating statistics consolidation. The primary function of TIP is to shorten the time between fact-happening and fact-usefulness--essential in such industries as food, apparel, petroleum, transportation, trade, banking and manufacturing.

- With TIP, the computers within the MARK III network actually talk by means of synthesized human voice. TIP asks questions, speech verifies responses and provides information pertintent to the particular application. The user simply presses the telphone keys to enter information. Since facts are entered with TIP right at their point of origin and verified immediately, a host of intermediate processing steps are eliminated... each of which could add time delays and potential errors to the final data.

● TIP can be used immediately with the same Touch-Tone*phones already in place in most regions of the United States. For those areas where Touch-Tone* telephones are not in service, a small, portable pad is available that fits over the mouthpiece of any instrument; instantly converting it to a TIP terminal.

● The full range of TIP's diversity has yet to be discovered. The fact that it has been successful for numerous companies in a short-period of time is due in part to its simplicity. The TIP voice leads users through the telephone session; requesting specific information and repeating it back for instant verification. As the voice is synthesized, its vocabulary is unlimited--including names, terms and technical specifications unique to a particular business.

*Trademark of the Bell System

THE INTERNATIONAL NETWORK ORGANIZATION

● General Electric's remote computing services are marketed by: Honeywell in Europe, Australia, Argentina and Canada; a joint venture with Dentsu Advertising, Ltd. in Japan; and Oy Nokia AB in Scandinavia.

● <u>The Honeywell marketing organization in Europe</u> is organized on two levels. First, each country within Europe is an independent company with its own local general management. Time-sharing or remote computing personnel report to that general management. Above the local level Honeywell is divided into three main groups. These are:

  - Honeywell Italia, which is independent.

  - Honeywell-Bull-CII, which covers the rest of continental Europe.

  - Honeywell Information Systems Limited which covers the UK.

● All the Bull companies in Europe have a dotted line to Paris. Heading up the services for all of Honeywell-Bull is J. Castle (Jim), an American who was previously on George Feeney's staff as Marketing Manager. Castle has a technical background as engineer· The U.S. management job was his first exposure to marketing. He is not on loan but was transferred from GE to Honeywell. Castle is located in La Défense in Paris.

• The time-sharing marketing organization within Bull is still located at Rue Gambetta. Reporting to Castle as Director General is Jack David, who interfaces with the GE organization in Holland.

• GE liaison organization in Europe. GE is still totally independent of Honeywell in Europe. Operating under the legal entity of the Mark Century Company, it has within the last year relocated from the switching center in London to the supercenter in Holland.

• The GE organization in Europe is primarily a liaison and support operation for Honeywell. The entire GE staff in Europe is limited to between 25 and 30 people and reports to Gary Muller. See Exhibit I.

   - The finance operation headed by F. Vandervaul, a Dutchman formerly employed by Honeywell, concerns itself with billing problems and answering inquiries from U.S. customers about their European bills. This can be a very complex and time-consuming process because Honeywell-Europe pays Honeywell-U.S. which in turn pays GE (GE only gets approximately 45% of the "retail" revenues).

   This is further complicated by the fact that CII collects all fees within its jurisdiction and imposes an additional tariff on top of the sales commission. Imagine a U.S. customer inquiring about a credit in Lyon! The inquiry goes from GE-U.S. to GE-Europe to CII Paris Rue Gambetta to Lyon and back.

   - Sales is headed by Al Boynton, who comes from Rockville, Maryland, GE-U.S.

EXHIBIT I

THE GE ORGANIZATION IN EUROPE

GARY MULLER

FINANCE	SALES	CLIENT SUPPORT	COMPUTER OPERATIONS	NETWORK PLANNING
FRED VANDERVAUL	AL BOYNTON	MALCOLM DAVIS	M. SWISSHAUSEN	JOHN PRYOR
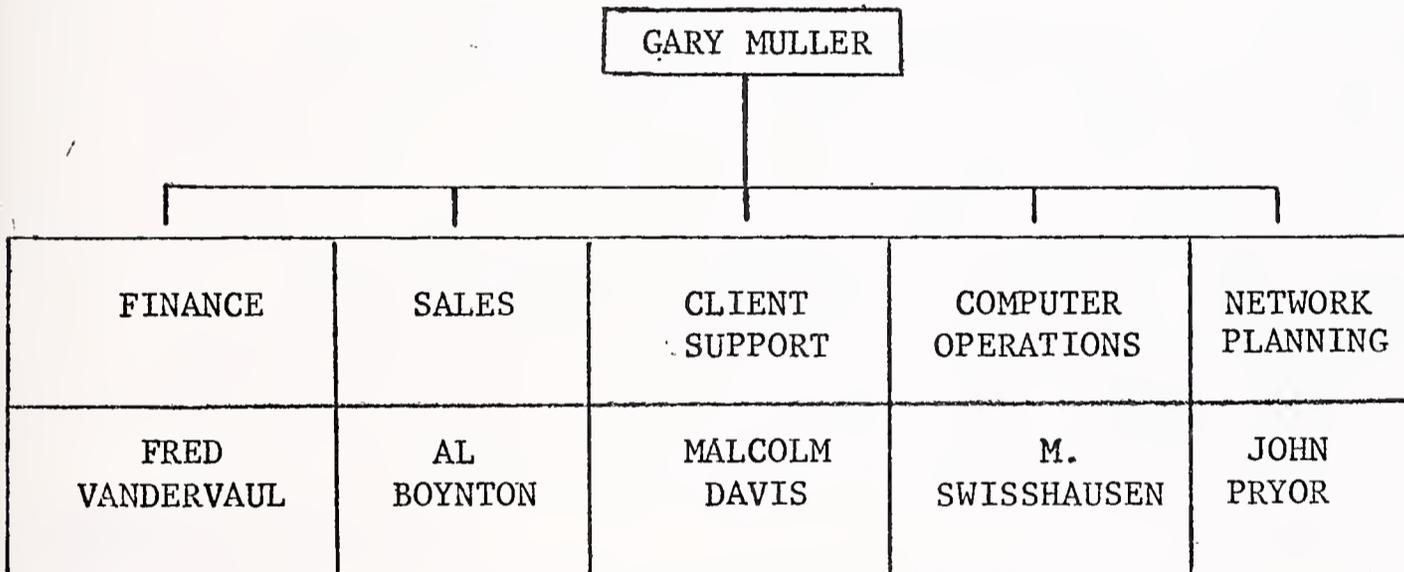
and performs a sales liaison function. This involves sales training, seminars on new products, and occasionally sales calls requested by the national organization.

- Client support is headed by Malcom Davis, a former UK Honeywell employee (working with him is Roger Dyer), a Cyphernetics founder who left after ADP acquired the company). This is a technical support function which includes quality control, solves new product introduction problems and integrates hardware and software modifications to the field.

- Computer operations is run by Swisshausen, a former Honeywell employee from Holland. This is a straightforward operation comprising people who operate and maintain the equipment.

- Network planning is managed by John Pryor, former Honeywell employee from Holland. This function forecasts the number of circuits and ports required and interfaces with the PTTs.

IMPROVING RELATIONS

- Relationships between GE in Europe and GE in the States have improved dramatically within the last two years. This improvement is based primarily on Castle's transfer as the top man for services in Europe, replacing the former director of the remote computing mission, M. Kopp.

- (Mike) Kopp, a Belgian, was mainly a hardware man and had no real appreciation of time sharing or the services business. Reporting to Kopp on the mission was a man called T. Kench. (Tony) Kench has been in the time sharing business since it started in the UK back in 1966. He

was "moved" by Honeywell on several occasions. They found him abrasive when he held line positions. He is, however, an excellent planner and marketing man--as long as marketing does not involve direct sales.

● Kench has been transferred to GE and now works on Feeney's staff as the number one liaison man responsible for Europe within GE. Relationships between Honeywell-Europe and GE have improved since these two individuals became the main interfaces.

● The same cannot be said of relationships within Europe. Companies and countries are still independent, still write their own marketing plans, and still do not talk to each other. There has, to date, been total failure to produce a European marketing plan, a European pricing policy, and a European management. Policies and procedures therefore tend to be influenced either by those who have the greatest political clout or those who produce the most dollars. Because of the dollars it produces and the communication advantage it has in the English language, the U.K. still dominates Europe.

EUROPEAN REVENUES

● Total European "retail" revenues for 1976 are estimated to be $34.5 million. Revenues are shown by country in Exhibit II. (See Exhibit II.)

● Of the total, only about $1 million is still from Mark I business. About $10 million is network-oriented (companies reporting to the U.S. parent). The rest consists of revenues derived from inter- and intra-European operations.

● "Retail" revenues from the rest of the world are estimated at $12 to $14 million and are concentrated in Australia, Argentina and Japan. Iran, the link to the Middle East, is not producing the revenues anticipated by GE.

● Total European revenues of $34.5 million for 1976 (see Exhibit II) exclude

EXHIBIT II

GE'S EUROPEAN REVENUES BY COUNTRY

COUNTRY	1976 REVENUES
United Kingdom	11.5
France	6.3
Scandanavia Norway Sweden Denmark Finland	5.7
West Germany	5.0
Holland	3.0
Italy	2.5
Others	.5
TOTAL	$34.5

($ Million)

media work, off-line dumping, and terminal rental and sales, which are significant. The only two countries which have produced any substantial growth have been the UK and Italy, but this has been offset by currency exchange losses.

- GE's 1968 revenues in a total European time-sharing market estimated at $3 million dollars were $2.4 million, an 80% market share.[*] In 1973 Honeywell estimated the European time-sharing market to be $70 million. Its own market share was approximately 35%, which represented revenues of $25 million.

- Despite five years of revenue growth, Honeywell's market share shrunk. During the last three years (1974 to 1976), growth has occurred at the rate of 10% to 12% per year. During this same period, Honeywell has been reducing its prices.

- Price reductions have taken place in two ways. First, most European revenues in 1973 were still from Mark I. Today, almost all revenues are from Mark III. Few customers have incurred a cost increase in moving from Mark I to Mark III. The majority have experienced a decrease. Second, dollars were expensive in 1973. The exchange rate in the U.K., for example, was 2.5 dollars to the pound. Today, it is only 1.7. In comparing revenues on a dollar basis, currency fluctuations must be taken into account. Relative to the dollar, the lira and the pound have lost 30% to 35%, while the Swiss franc and the mark have gained 20% to 25%. Honeywell's revenues during the last three years have grown in local revenues 25% to 30% per year. See Exhibit III

[*] Honeywell took over the T/S marketing responsibility for Europe in 1970.

Exchange Rate Variations

1973 – 1977

COUNTRY	1973 $	1977 $	GROWTH
ITALY	.0017	.0011	– 35%
UK	2.48	1.72	– 31%
SWITZERLAND	.31	.39	+ 26%
GERMANY	.35	.42	+ 20%

AVERAGES

1973: $70 x 35% = $24.5 Million

1976: $24.5 x 12% AACR = $34.5 Million

but in dollar reporting a mere 10% to 12%.

● Of the 1973 revenues of $25 million, almost $7 million came from the UK; thus the UK not only had a dominant position within Honeywell Europe then, but has increased it despite currency losses. *

● Segmenting revenues by mode of service more than 90% of revenues are derived from time sharing. Thus far only one country has installed dedicated lines to provide a remote batch service; Switzerland, to provide service for one customer only. Revenues of this customer are estimated at $1 million dollars for this year.

● Within the 90% derived from time sharing, approximately 90% of that is foreground processing. Background has as yet not been successful in Europe. One major reason for this has undoubtedly been the long delay in introducing high speed service. High speed service was due to be introduced in UK in 1973; 3½ years later it is being implemented. Reasons mainly were that it was not found to be technically feasible or financially possible to do on a transatlantic basis and therefore had to wait for the opening of the European super center.

EUROPEAN NETWORK AND HARDWARE

● Presently, there is one supercenter in Europe located in Amsterdam, Holland. This center is equipped with two Honeywell 6088 computers. These are single processors each having 288K memory with fast transfer capabilities. They are backed by mass storage and communication processors.

* GE receives only 45% of the European retail revenues.

4020

Diginet 1600

Diginet 160

6088

6088

Disk Files

6088

Background
Processing Per-
formed by specially
Modified Good Line
Systems

Hon 416
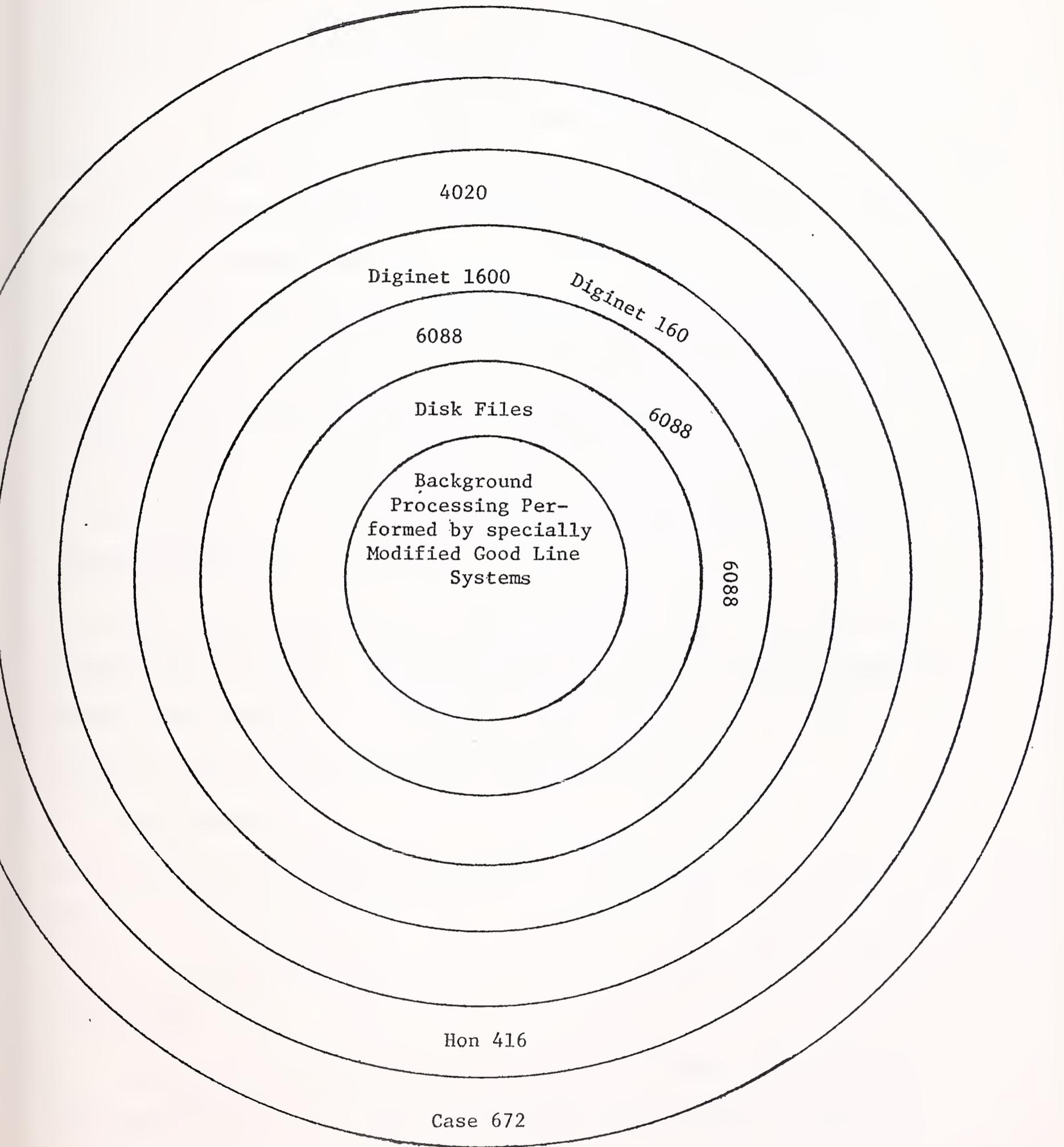
Case 672

INPUT

● The network into the supercenter is as follows: Each local country has muxes (Case 672s) connected to local concentrators (Honeywell 416s). The local concentrators, either within the country or on a multi-country basis, are connected to concentrators—modified GE process control 4020s. These concentrators are interfaced into Diginet 1600s which are located at the supercenter in Holland. In turn, the Diginet 1600s are the front end for the Honeywell 6088s.

● The network interconnection into the U.S. is still operational to the East Coast via the switching center in London by satellite or by undersea cable. There is presently on order a backup switching capability and communications for the Netherlands. The only additional equipment known to be on order, excluding communications for the supercenter, is four Honeywell 6088s worth $6 million.

● There are no present plans to add IBM equipment (or that of any other manufacturer) in Europe. This is a highly sensitive question with Honeywell. However, the indication is strong that in the foreseeable future IBM equipment will not be placed in the supercenter in Europe.

● The following equipment is also still in use in Europe. In the UK there are two 265s located in Manchester. In Spain there are two 265s. In France the Lille center consisting of four 265s is still operational, but it is to be phased out by June 1977. Portugal is still running on 265s, as is Greece.

● It is Honeywell's stated objective to have all Mark I service using 265s phased out by 1978. All of Europe will then be running on Mark III.

- Telex is not available in any country, even though there is still a requirement for it, and the French in particular are extremely enthusiastic about the potential for the service.

Applications and Industries

- In Europe Honeywell is still concentrating very heavily on the financial area. This still represents the main bases of their revenue and growth. Included within financial are banks both European and American, as well as European requirements within large corporations for financial reporting, consolidation, forecasting and modelling.

- The new market direction will be heavily government oriented. Honeywell is already a major supplier of services to the UK government and a limited supplier to other European governments. With the Honeywell Bull CII merger, CII must become the favored vendor of the French government. Penetration of the French government should make the governments of other members of the Common Market more accessible. France still exerts great influence within the Common Market, despite the rivalry of West Germany and the U.K.

- In the application area the most successful system is Tabol. Tabol is the successor to Oliver. Oliver probably beat all revenue records for any system ever developed by a time sharing company. It represented a break away effort some five years ago on behalf of Honeywell-UK to develop an alternative to Autotab and its family. Oliver was not only far superior but was much more flexible, much lower cost and was capable of being tailored to each country's requirements.

- As in the U.S., Honeywell has emphasized heavily the data base and the data management area. This has meant significant revenue from DMS. It is also likely that high speed service which will become available later this year in Europe will create new application areas.

- Looking to the future it is forecast that with the introduction of high-speed service, remote batch will be a high growth area and background use will also accelerate.

- There are no known facilities management clients in Europe. This is still regarded as a tabu area because it tends to bring Honeywell time sharing into direct conflict and competition with its hardware sales function.

R&D and Software Procurement

- Honeywell in Europe spends very little money in R&D. What money is spent primarily goes into the communications area.
    - Hardware: many of the local PTTs still do not have the capability of technically developing services required and Honeywell therefore has to work directly with mux and modern vendors.
    - Software: many of the protocols developed on the American network have to be modified or changed to meet local PTT standards or requirements. The remaining dollars go into internally developed software.

- There is no European development organization or effort. What does exist is mainly used as an inquiry channel to the U.S. to solve hardware and software problems.

- Occasionally countries developed applications on their own but
these tend to be on a one of a kind basis and generally are with a
particular customer in mind. The UK started several years ago a
development group to acquire and develop software. The start was made
in the financial area but most of what had commenced never came to
fruition and has now been disbanded. Honeywell therefore looks to GE
to be the developing force in both applications and R&D for on-line
services, improvements and new services in the future.

- Looking at the area of strategies and liaison with GE, it is still
difficult to identify how much of Honeywell's revenue in Europe is
either directly attributable to GE or to U.S. based customers. A high
percentage of the revenue comes from U.S. companies. Also the majority
of these are GE customers. The U.S. customer influence is therefore
Honeywell successfully uses GE's U.S. penetration as a
marketing ploy and a counter to the competition from smaller local net-
work companies. Measurement of this is so vague that even when GE still
passes through a U.S. contact to Honeywell they very rarely get any feed-
back and the only way they know that the company ever becomes a customer
is generally by the customer telling them.

MAJOR STRENGTHS AND WEAKNESSES OF GE HONEYWELL OVERSEAS

- The old ones still remain.
    - The extensive network. No one in the business, including IBM in Eur-
      ope has anything as fully developed as the Honeywell network. Not only
      does it now cover every major Western European country, it has

multiple drops within each country. Some countries, in fact, are now getting up to twenty or more cities connected.

- · Market penetration. Honeywell inherited from GE in Europe being first in the business, and in this case first in the business has meant customer loyalty.

● Honeywell has retained certain customers for over ten years. It is very difficult for anyone either local or U.S. to break this market loyalty. What breakdown in loyalty has occurred has very seldom been because a customer changed from Honeywell to an alternate vendor. The main reason an alternate was chosen is because he identified either economics for a certain type of service or a specific package or application area or service capability that Honeywell doesn't have. Therefore the customer uses the other vendors mainly in thesese specialty areas.

● Major weaknesses: By far the greatest one, is still the very tenuous liaison between the countries within Honeywell. Friction still runs very, very high between the UK and the French. They still do not trust each other and they still do not work as one. Even within France the CII merger has made the French a disjointed company. They still do not think as one company and the infighting and politics are still carrying on.

● Other weaknesses: Because of the inherent profit potential and greed on the part of Honeywell management the pricing runs from expensive to incredible. Honeywell has the problem of being a market leader and therefore always has to be on the defensive since every vendor is after their business.

However, each country sets its own pricing level and its rates before going to Paris to get approval. There is no single price policy for the whole of Europe. Management believes it may be impossible to have a single price. However, as long as individual countries work in at least the same direction, charging similar prices for similar products, management feels content.

THE JOINT VENTURE IN JAPAN

● The GE-Dentsu joint venture is headed by Akito Yanai. It has offices in Tokyo, Osaka, Nagoya, Hiroshima, Fukuoka, and Sapporo. Hiroshima had sales of $3.3 million in 1974 and increased to almost $5 million in 1976. This is somewhat of a disappointment for the goal was to quadruple sales by 1977--a goal that apparently will not be met.

● GE-Dentsu's marketing plan is aimed at serving industrial customers as well as large-scale government-sponsored construction projects. "Telephone Information Processing" (TIP) has been started, offering information retrieval as well as a computing service for inventory and marketing data through in-house touch-tone telephones with voice outputs in Japanese. The Nippon Telegraph and Telephone Public Corporation (NIT) offers similar service called "DIALS," using touch-tone telephones, but the NTT system is not capable of handling information retrieval.

● In 1973, Mark II, the remote-batch as well as conversational-type time-sharing service, which permits data base management through linkage between in-house computers and an international network TSS, was introduced in Japan.

● At that time GE started an economic and financial-oriented data bank service called "Management Analysis Projection" (MAP), to provide Japanese

customers with analysis and projection of various U.S. economic data. GE

has also recently added financial data, furnished by the Industrial Bank

of Japan, which pertains to several thousand Japanese industrial firms to

its data bank at the Cleveland Center. This data is available to U.S.

and European customers.

● GE is also offering data bank services in the scientific and

technological fields. Mircocomputer software developed by NEC and Toshiba

and numerical control programs developed by the Ikegami Iron Works are now

stored in the GE software data bank. Such data are being utilized by

U.S. firms which use Japanese-made microcomputers or numerical control

machines. Major American microcomputer makes, such as Rockwell, Intel,

and Motorola, as well as major Japanese microcomputer makes, such as

Fujitsu, Hitachi, NEC, and Toshiba are producing and using the smae

numerical control and microcomputer programs.

● Through the international network system, GE's data bank services

have achieved a multi-national customer base, serving multi-lateral

demands, e.g., providing foreign data to Japanese users and providing

Japanese data to foreign users.

STRENGTHS AND WEAKNESSES

●   <u>Major strengths</u>. The strengths of GE are still the same as they were several years ago. They are:

-     size of the GE organization.

-     The GE name, and the resources the company can bring to bear on any account.

-     GE still has the largest network, both domestically and internationally. This not only produces revenue but is by far the best introduction to new business and also acts as the best defense against competition. Most large accounts are multi-national and/or multi-location companies, and even though they may not have immediate networking application requirements they are going to have the requirement in the future and will therefore need GE.

-     The multiple centers have become very significant, not just the fact that there is a Brook Park and a Rockville center in the U.S., but there is now also a physical center in Europe. The backup of different continents, of different time zones is possible. However, for the time being the limitations of the communication industry prevent the practical hook up of disks in the U.S. to mainframes in Europe. However, customers buy on the promise that this will be implemented in the future.

-     This may be seen by those who continually think state-of-the-art equipment as a shortcoming, but the users consider it a strength. There is nothing very new about the Honeywell equipment or the operating systems GE has; they are proven, they are completely

debugged, they are reliable, and performance tends to be above standard for the industry.

- GE can back up any situation! Any mainframe can fail and users can be transferred very quickly to another mainframe; disks can go down, and the situation can be recovered; a communication link can fail and the message is rerouted. Therefore, if any part of the system goes down, the situation is recoverable, and although the user does see an interruption of service which may annoy him, he can recover and within a very short period be operating again. A lot of the strength comes from the fact that GEISD is the biggest company in the timesharing business and that GE is an organization with enormous growth potential, for the individual who fits well into the structure and can become a "company man."

- Major weaknesses. The most significant weakness is the one that has always been present. Total lack of marketing direction, and perhaps lack of management.

- GE regards their service, and this mainly emanates from George Feeney himself, as being so technically good that people should use it, pay for it and be happy. Therefore, why market the product?

- GEISD has never produced a sales commission incentive plan which lasted more than one year.

- The fact that 80% of revenues is produced by 20% of the clients makes GE vulnerable to in-house losses--especially with the new systems recently announced by IBM. Since the 370/158 is now at least one generation behind in hardware and software.

●   GE likes to quote that the average revenue per client is between five and ten thousand dollars per month, depending on where and why they are citing this statistic. This statistic is true if only the over $1,000 clients are counted. Since the "others" are the neglected group, GE is not leveraging the "entry level" client.

MARK III® Service Price Schedule

Effective July 1, 1976
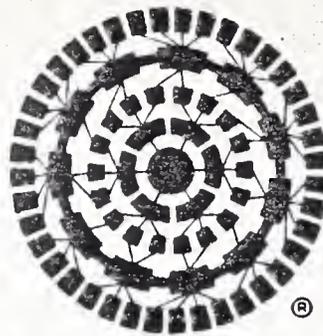
1. INITIATION OF SERVICE CHARGES

The initial validation charge for Service is $100.00

2. MONTHLY CHARGES

Monthly charges will be calculated on the basis of Customer usage, subject to a minimum charge of $5.00 per invoice and, commencing after the second billing month following the date of initial validation for each such Service, a minimum monthly charge of $100 per catalog for Foreground Service, $100 per catalog for GCOS Background Service and $100 per catalog for VS Background Service. The minimum monthly charge per catalog, however, shall not be applicable with respect to authorized use of catalogs of third party authors established pursuant to Network Software Service Agreements between the Company and third party authors. File conversions, invoice minimums, COM, and Miscellaneous Charges shall not be used to determine attainment by Customer of the monthly minimum charge per catalog. Each valid User Number requires one storage unit, the charge for which applies toward the monthly minimum charge. Charges for usage of each Service shall be separately accumulated, treated and billed (except for the Initiation of Service Charge). Charges will be determined as follows:

3. FOREGROUND (Conversational time-sharing, conversational remote job entry, high-speed job entry and retrieval) SERVICE

Terminal Connect Time & Input/Output Characters — Terminal Connect Time is that period of time elapsed between connect time and disconnect time as indicated and/or recorded by the system. Terminal Connect Time as recorded by the system is accumulated periodically (usually daily) and totaled in hours, rounded to the nearest hundredth of an hour, for the period involved. The sum of such periodic accumulations and calculations in any monthly billing period constitutes the total monthly Terminal Connect Time to be charged. Input/Output Characters are measured per thousand characters as indicated and/or recorded by the system. Input/Output Characters are defined as all characters, including non-printing control characters, transmitted to and received from the system.

National/Metro Access — Metro Access is access to the MARK III Network which is accomplished by dialing a Metro Access telephone number as listed in Company's International Access Directory. National Access is all other access to the Network. In the case of 1200 Baud Service, Metro Access requires full duplex operation, and in the case of High Speed Service, Metro Access is available only for 4800 Baud operation.

110-300 Baud Service — The following pricing options are available per catalog:

	Terminal Connect Time	Input/Output Characters
Option (1)	$ 7.70 per hour	$ .27 per thousand
Option (2)	$11.00 per hour	$ .11 per thousand
Option (3)	$15.00 per hour	(No Charge)

1200-Baud Service — (Half or Full Duplex Operation) The following pricing plans are available per catalog:

		National Access	Metro Access
Plan 1	Terminal Connect Time	$33.00 per hour	$20.00 per hour
Plan 2	Terminal Connect Time	$16.00 per hour	$10.00 per hour
	Input/Output Characters	$ .16 per thousand	$ .10 per thousand

With respect to both 110-300 Baud Service and 1200 Baud Service, Customer will be billed in accordance with Option (1) or Plan (1), as applicable, unless Customer gives Company written notice of election of a different pricing option or plan. Any election to change the applicable pricing option or plan which is made after the initiation of the service involved will be effective as of the first calendar month which commences not sooner than fifteen days after the receipt of Customer's notice of such election.

Telephone Information Processing Service

	National Access	Metro Access
Terminal Connect Time	$16 per hour	$8 per hour

Continuous Access Plan

Fixed charge per logical line	$300 per month
Input/Output Characters — Prime Time	$.20 per thousand
Input/Output Characters — Non-Prime Time	$.05 per thousand

Customer may elect the Continuous Access Plan by giving Company written notice thereof, specifying the number of logical lines to be validated and the specific user number(s) to which they are to apply. Customer may at any time thereafter have such logical lines devalidated by similarly notifying Company. The fixed monthly charge per logical line will be prorated for the month in which validation occurs, but there will be no proration of such changes upon de-validation. The Continuous Access Plan is only available with respect to 110 to 300 baud, and 1200 baud service. It does not apply to TIP or High Speed Service or in connection with Administrative User numbers and functions.

(See next page for additional price schedule)

GENERAL ⊕ ELECTRIC

High Speed Service (2000-4800 Baud)

	National Access	Metro Access
Terminal Connect Time	$11.00 per hour	$7.00 per hour
Input/Output	$ .13 per hundred records	$ .09 per hundred records

With respect to High Speed Service usage within the continental United States during non-prime time hours under service contracts to which this Price Schedule applies, a special price of $7.00 per hour for Terminal Connect Time and $.09 per hundred Input/Output records will be charged when National Access is utilized, and a special price of $4.00 per hour for Terminal Connect Time and $.06 per hundred Input/Output records will be charged when Metro Access is utilized. These special prices will not apply, however, to usage of catalogs which are validated in time zones outside the continental United States.

RPS III Service

Print Station	$800.00/month
Print Station with Card Reader	$950.00/month

A credit shall be applied against the monthly rental of RPS III and will be equal to 50% of the total High Speed Service usage, up to a maximum monthly credit of $600.00 per Print Station or $700 per Print Station with Card Reader, in the catalog(s) owned by the Customer and accessed by RPS III terminal(s). In the case where multiple RPS III terminals access a single catalog, the credit to be applied will be divided evenly among the terminals up to the maximum allowable credit per RPS III as defined above.

In certain designated geographic areas an additional charge will be made for remedial maintenance. A one-time charge for installation and removal of the RPS III terminals will be made as follows:

RPS III Print Station	$490.00
RPS III Print Station with Card Reader	$590.00
Addition of Card Reader Option	$100.00

Computer Resource Units & Program/Data/HISAM Storage Units — The recorded Computer Resource Units (CRU) are accumulated periodically and the sum of such periodic accumulations in any monthly billing period constitutes the total monthly Computer Resource Units to be charged.

A Program Storage Unit (PSU) is defined as 320 36-bit words, including administrative characters normally required by the system. A Data Storage Unit (DSU) and HISAM Storage Unit (HSU) provide the same storage space as a PSU; however, a DSU must be used for storing non-executable data in binary form or core image files and an HSU must be used for storing non-executable data in binary form to be accessed only by the MARK III Hierarchical Index Sequential Access Method (HISAM) subroutines and related library programs. Any portion of a PSU/DSU/HSU used for storage is charged at full PSU/DSU/HSU rate. Amount of storage used shall be determined on the basis of a monthly billing period average calculated as follows: Measurements are taken periodically (usually daily) of the net amount of storage units in use overnight and the aggregate amount of storage units used during the day, and these measurements are used to calculate a daily average. The sum of such periodic daily averages is divided by the number of such daily averages to arrive at the average monthly Program/Data/HISAM Storage Units.

The following prices apply per catalog:

Computer Resource Unit	Program Storage Unit	Data Storage Unit	HISAM Storage Unit
$.11 each	$.80 each	$.22 each	$.11 each

Archival Storage — Archival Storage provides an auxiliary storage media for data not requiring direct or immediate access. At the Customer's request from his terminal specified files are duplicated on magnetic tape and stored external from the system. Archivally stored files may be retrieved on an overnight basis.

$ 5.00 per file to store
$ .02 per Archival Storage Unit (ASU) per month or any portion thereof (ASU = PSU or DSU or HSU)
$10.00 per file to retrieve.

Priorities — Users may select processing priorities in the Foreground. This feature, called INDEPENDENT RUN, offers the following processing priorities and prices:

Immediate	Standard CRU's times 1.0
Deferred (start within 3 hours)	Standard CRU's times .6
Overnight (start within 24 hours)	Standard CRU's times .4

4. BACKGROUND (Remote Batch Processing) SERVICE

A. GCOS Background

Computer Resource Unit — $300.00 per Computer Resource Unit (CRU) as recorded by the system. Measured usage is accumulated periodically; the sum of such periodic accumulations in any monthly period constitutes the total monthly CRU's to be charged. For usage during non-prime time hours of catalogs validated in time zones inside the continental United States, however, the special price per CRU is $245.00.

Background Storage — $.10 per Data Storage Unit (DSU) per month. A Data Storage Unit (DSU) is defined as 320 36-bit words, including administrative characters normally required by the system. Any portion of a DSU used for storage is charged at the full DSU rate.

Magnetic Tape Storage — Company retention of Customer's files on magnetic tape will be charged at the rate of $5.00 per reel per month or any portion thereof. A charge of $3.00 per mount for unsecured tapes and $1.00 per mount for secured tapes will be made for each magnetic tape mount that occurs during processing.

Priorities* — Users may select processing priorities in the Background. Following are the priorities and prices.

Super	Standard CRU's times 4.0
Express (start within 15 minutes)	Standard CRU's times 2.0
Normal (start within 3 hours)	Standard CRU's times 1.0
Overnight (start within 24 hours)	Standard CRU's times .75

*If G.E. is unable to fill the requested priority, the actual priority applied will determine the charge to be made.

(See next page for additional price schedule)

GENERAL ⊛ ELECTRIC

B. VS Background

Computer Resource Unit — $300.00 per Computer Resource Unit (CRU) as recorded by the system. Measured usage is accumulated periodically; the sum of such periodic accumulations in any monthly period constitutes the total monthly CRU's to be charged. For usage during non-prime time hours of catalogs validated in time zones inside the continental United States, however, the special price per CRU is $235.00.

Background Storage — $.81 per Information Storage Unit (ISU) per month. An Information Storage Unit (ISU) is defined as 13,030 Bytes including administrative characters normally required by the system. Any portion of ISU used for storage is charged at the full ISU rate.

Removable Disc Storage — $75.00 per month for a Model 3336 Disc Pack and $30.00 per month for a Model 2316 Disc Pack. A charge of $10.00 will be made for each disc pack mount that occurs during processing.

Magnetic Tape Storage — Company retention of Customer's files on magnetic tape will be charged at the rate of $5.00 per reel per month or any portion thereof. A charge of $1.00 will be made for each magnetic tape mount that occurs during processing.

Priorities — No priority options are available.

5. **FILE CONVERSION** — Company will, upon acceptance of a Customer's RMS request, or upon execution of a Customer's BMC program, convert Customer files to/from the disc storage media of the MARK III System. The following prices apply to MARK III System file conversion operations and are in addition to the CRU's required to accomplish the job.

Activity	Remote Media Service (Foreground)	Bulk Media Conversion (Background)
Disc to Tape	$15/Reel	CRU's Only
Tape to Disc	$15/Reel	CRU's Only
Disc to Cards	$3.50/1000 Cards	$3.50/1000 Cards
Cards to Disc	$1.75/1000 Cards	$1.75/1000 Cards
Disc to Printer (one-part paper)	$1.75/1000 Lines	$1.75/1000 Lines
Multi-part Paper	$5/Setup	$5/Setup
Minimums/conversion	$10/Job	$10/Job
GE-Provided Tape	GE Cost plus 20%	GE Cost plus 20%

Other — Charges for File Conversion will be billed on a catalog basis and included with other catalog charges for usage of MARK III Service. Charges for File Conversion will not, however, apply toward attainment by Customer of the monthly minimum charge per catalog.

6. **COMPUTER OUTPUT MICROFILM (COM)** — The off-line COM process (the entire process of developing COM once the MARK III System has generated the COM formatted tape) is an administrative charge. As such, COM usage will not apply to the monthly minimum charge for Background Service.

Prices for Computer Output Microfilm Service

		Miscellaneous	
Fiche Originals	$ .50 per Fiche + .018 per Frame	Special Forms Overlay	GE COST + 20%
Fiche Copies	$ .35 per Fiche	Mylar Overlay for Tests	GE COST + 20%
16MM Roll Originals	$20.00 per 1000 Frames	Miracode Film Cartridge	$ 1.50 each
16MM Roll Copies	$ 3.00 per 1000 Frames	Service Minimum	$10.00 per Job
			$ 2.00 per Delivered Location

7. **MISCELLANEOUS CHARGES** — These charges do not apply toward the attainment of the monthly minimum charge per catalog.

Administrative Changes — Customer may request Company to change, add, or delete User Number, service validations, validations of Background catalog tape entries, and/or terminal validations. A charge of $1.00 will be made for each change. Each request is subject to a minimum of $10.00

Restoring Customer-Deleted Files — No files can be restored after the elapse of six (6) months from the day of their deletion. Prior to that time, the following rates will apply:

(1) Request within fifteen (15) days of deletion — $10.00 per file.

(2) Requests after fifteen (15) days but less than six (6) months from the day of deletion — $15 per file (month-end files only).

There will be a minimum charge of $25.00 per request completed by Company.

File Transfer — Upon request files may be transferred from one catalog to another for a charge of $2.00 per file, subject to a minimum of $10.00 and a maximum of $50.00 per request.

8. **SYSTEM UP-TIME** — The scheduled availability periods for MARK III Foreground Service and GCOS Background Service are 24 hours a day, 7 days a week, except for 12 hours of scheduled system maintenance time each weekend for Foreground Service and 16 hours of scheduled system maintenance time each weekend for GCOS Background Service. The scheduled availability period for MARK III VS Background Service is from 4:00 AM to 10:00 PM, local New York Time, Monday through Friday and from 8:00 AM to 10:00 PM, local New York Time, on Saturday. Warranted system up-time with respect to each type of service is 90% of the scheduled hours of availability of such service during each calendar month.

9. **PERSONNEL SERVICES** —

Custom Applications Specialist	$30.00/hour
Senior Custom Applications Specialist	$35.00/hour
Consultant	$45.00/hour

Customer will be charged for travel and living expenses coincident with performance of the service when such expenses are incurred outside the sales zone in which the Customer has contracted for the service.

10. **DEFINITIONS**

Non-Prime Time — Non-prime time hours are defined as all hours except 8:00 AM to 8:00 PM catalog time, Monday through Friday, and holidays.

Catalog Time — Catalog time is defined as the time zone in which a catalog is validated. This is where the greatest usage occurs, not necessarily where catalog control is located. Company reserves the right to determine, for validation purposes, the Customer's time zone where greatest usage occurs.

Holidays — Holidays are defined as the following legal public holidays, in accordance with catalog time, as established by 5 U.S.C. Sec. 6103(a): New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day.

———GENERAL ⊛ ELECTRIC———

The prices contained herein apply only to the continental United States. Services of the Information Services Business Division are also available in principal cities throughout Europe, Canada, Australia, Mexico, and Japan through authorized distributors of General Electric.

Check your local telephone directory for the address and telephone number of the office nearest you. Or write . . .

General Electric Company
Information Services Business Division
401 North Washington Street
Rockville, Maryland 20850

GENERAL ELECTRIC

TermiNet ® DATA COMMUNICATION PRINTER

LEASE AND MAINTENANCE PRICE LIST
EFFECTIVE FEBRUARY 9, 1976

GENERAL INFORMATION

Monthly lease rates include maintenance service within zone one (approximately a 25 mile radius of the service center) and are based on 40 hour per week usage. For applications exceeding this usage consult the factory for appropriate pricing.

In addition to the monthly lease rate add prices for the monthly zone adder (if applicable); also add installation charge and the installation zone adder (if applicable).

Prices shown represent the monthly rate for one year and are subject to the multipliers shown below for alternative lease terms. Prices shown for installation and all zone adders apply regardless of lease term.

| Month = 1.24 | 1 Year = 1.00 | 2 Years = 0.95 | 3 Years = 0.92 | 4 Years = 0.90 | 5 Years = 0.89 |

STANDARD CONFIGURATIONS

TERMINET 30 PRINTERS (117V, 60Hz): include adjustable pin feed, upper case printing, vertical format unit, RS232C 2-wire interface, pedestal without telephone shelf, and parity error detection. ①

TERMINET 300 PRINTERS (117V, 60Hz): include 118 print columns, automatic motor control, transparency switch (except SR model), three-position char/sec. rate switch (either 10/15/30 or 10/30/120 char/sec.), and RS232C interface. External paper handler included with forms tractors and Split Platen models.

TERMINET 1200 PRINTERS (117V, 60Hz): include 120 print columns, forms tractor, transparency switch (except SR model), 10/30/120 char/sec. rate switch, external paper handler and RS232C interface.

TERMINET PRINTERS

TYPE	TERMINET 30		TERMINET 300			TERMINET 1200
	80 column	132 column	Friction Feed ③	Pin Feed ② ③	Tractor	Tractor
SR (Send-Receive)	$ 83	$ 88	$105	$107	$113	$144†
KSR (Keyboard Send-Receive)	88	93	112	114	120	158†
MSR (KSR with Magnetic Tape Accessory. For TermiNet 30 select single or dual Magnetic Tape Bridge)	120† (single) 158 (dual)	125† (single) 163 (dual)	175	177	183	232†
ASR (Pedestal) with Paper Tape Reader and Punch	188	193	219	221	227	258†
ASR (Console) with Paper Tape Reader and Punch	xxxx	xxxx	219	221	227	258†
Split Platen SR (8½" paper width left platen, 3½" paper width right platen)				145		
Split Platen KSR (8½" paper width left platen, 3½" paper width right platen)				152		

NOTE ① Refer to Purchase Price List for prices of TermiNet 30 Printer Replacement Ribbon Cartridge and extra cassettes for Magnetic Tape Bridge.

NOTE ② Specify paper width of 8½", 9", 9½" or 12-27/32" (pin-to-pin equivalents, 8", 8½", 9", or 12-11/32") for proper platen size.

NOTE ③ Also specify Line Length Option needed.

TERMINET PRINTER OPTIONS	ORDER CODE	PRICE
Answerback	ANS .	$ 3†
Automatic Answerback	AANS	4†
Console Forms Tray & Restacking Shelf	CONSHLFL	5
Copyholder for Pedestal Printers	CHP	2
Copyholder for Non-Pedestal Printers	CHC	3
External Paper Handler (for TermiNet 300 friction and pin feed units)	EPH	3
Foot Switch (for TermiNet 30 Magnetic Tape Bridge control)	FTSW	3
Forms Accumulating Shelf (for pedestal)	PEDSHLF	2
Horizontal Tabulation (not available for TermiNet 30)	HT	8†
Line Length Option for Friction Feed and 8½" Pin Feed end of the line alarm at column 75 (for TermiNet 300)	LL75	No Charge
Line Length Option for 9" and 9½" Pin Feed end of line alarm at column 80 (for TermiNet 300)	LL80	28 (One Time Charge)
Lower Case Printing (for TermiNet 30)	LOWCASE	5†
Numeric Cluster	NC	5
Parity Error Detection (standard on TermiNet 30)	PAR	3†
Pedestal for MSR (includes magnetic tape accessory shelf, telephone shelf, and AC outlet) (standard on TermiNet 30)	MSRPEDL	8
Pedestal for SR and KSR (includes telephone shelf and AC outlet) (standard on TermiNet 30)	KSRPEDL	7
Platen Conversion Kit to change pin feed size or to change from friction to pin feed (for TermiNet 300)	Kit8.5, Kit9.0 Kit9.5	8
Platen Conversion Kit to change pin feed platen to friction feed platen (for TermiNet 300)	FFKIT	6
Selective Addressing (for TermiNet 300 and 1200)	SELADD	10†
Strapping Changes (as specified on order)	STRAP	28 (One Time Charge)
Telephone Shelf for Pedestal (standard on pedestal for TermiNet 300 and 1200)	PHONSHLF	1†
Upper Snap-in Panel for Console	CONPAN	2
Vertical Format Unit (older models use Vertical Tab and Form Feed) (standard on TermiNet 30)	VTFFII	10

† Price changes

TERMINET PRINTER INTERFACE EQUIPMENT

	ORDER CODE	PRICE
20 MA current interface (Replaces Standard RS232C Interface) external current source (TermiNet 300, 1200)	20MA	No Charge
20/60 MA current interface (for TermiNet 30) Internal current source	INT20MA	$ 5†
External current source	EXT20MA	5†
300 Baud Originate Only Integral Modem	300IM	10
300 Baud Auto Answer Integral Modem	300IMANS	20
TDM114B13 Acoustic Coupler (Originate Only) (TermiNet 30 also requires telephone shelf)	114B	10
TDM115B13 Acoustic Coupler (Originate/Answer) (TermiNet 30 also requires telephone shelf)	115B	15
Dual Modem, Manual Answer (Also order "Line Control", and Pedestal or Console for 300 and 1200 units)	DUALMOD	45
Dual Modem Auto Answer (Also order "Line Control", and Pedestal or Console for 300 and 1200 units)	DUALMODA	55
Data Set Control (for TermiNet 30)	RS232DSC	3†
Data Set Switch Box (Also order "Line Control" and Interface for 202C Data Set)	SWBX3/12	8
Line control of Half Duplex Data Set or Modem	LC9	3
Interface for 202C Data Set (Also order "Line Control") Not Required for TermiNet 30	202C	3
1200 Baud Integral Modems (Also order "Line Control" except with modem for Dedicated Line):		
Automatic Answer with Reverse Channel (2 wire half duplex)	12IMCBS	35
Automatic Answer without Reverse Channel (2 wire half duplex)	12MODCBS	30
Dedicated Line (4 wire full duplex)	12MODPL	25
Manual with Reverse Channel (2 wire half duplex)	12IMCDT	30
Manual without Reverse Channel (2 wire half duplex)	12MODCDT	25

TERMINET PRINTER SERVICE ZONE ADDERS

To insure the printers remain in good operating condition equipment may not be leased without General Electric authorized service. Prices listed above include maintenance within approximately a 25 mile radius of a TermiNet Service Center. A monthly zone adder charge of $12.75 per zone must be added for each 25 mile increment beyond the initial 25 mile radius.

PRINTER INSTALLATION SERVICE④

The following are one-time charges. Zone adders apply for each 25 mile increment beyond the first 25 mile radius from the service center.

	TermiNet 30	TermiNet 300	TermiNet 1200	Zone Adder⑤ (For Each 25 Miles)
SR, KSR, and Split Platen Printers	$120.00	$120.00	$140.00	$64
MSR or ASR Printers (Pedestal Model)	150.00	150.00	170.00	64
ASR Printers (Console Model)	xxx	190.00	210.00	64

NOTE ④ There is no charge for removal service when lease terminates.
NOTE ⑤ When multiple printers are installed simultaneously at one location beyond zone one, apply zone adder to only one printer.

INSTALLATION OR REMOVAL OF OPTIONS ON PREVIOUSLY INSTALLED PRINTERS⑥

	One Time Charge (Zone 1)	Zone Adder (Each 25 Miles)
Addition of Reader and Punch (Pedestal)	$60.00	$32.00
Addition of Reader and Punch (Console)	80.00	32.00
Addition of Magnetic Tape Cassette Accessory	60.00	32.00
Other Options	60.00	12.75

NOTE ⑥ When multiple options are installed simultaneously on the same printer, price as if only one were installed. Apply charge for the highest priced item installed.

FOR INTERNAL USE ONLY   PRINTER ORDERING CODE

TYPE	TERMINET 30 PRINTERS		TERMINET 300 PRINTERS			TERMINET 1200
	80 Column	132 Column	Friction Feed	Pin Feed⑦	Tractor	
	Order Code	Order Code	Order Code	Order Code	Order Code	Order Code
SR (Send-Receive)	SR80L	SR132L	SRFFL	SR–L	SRFTL	SRFTL
KSR (Keyboard Send-Receive)	KSR80L	KSR132L	KSRFFL	KSR–L	KSRFTL	KSRFTL
MSR (KSR with Magnetic Tape Accessory. For TermiNet 30 select single or dual Magnetic Tape Bridge)	MSR80SL	MSR132SL	MSRFFL	MSR–L	MSRFTL	MSRFTL
	MSR80DL	MSR132DL				
ASR (Pedestal) with Paper Tape Reader and Punch	ASR80L	ASR132L	ASRFFL	ASR–L	ASRFTL	ASRFTL
			ASRPEDL	ASRPEDL	ASRPEDL	ASRPEDL
ASR (Console) with Paper Tape Reader and Punch			ASRFFL	ASR–L	ASRFTL	ASRFTL
			CONSOL	CONSOL	CONSOL	CONSOL
Split Platen SR (8½" paper width left platen, 3½" paper width right platen)			SRSPL			
Split Platen KSR (8½" paper width left platen, 3½" paper width right platen)			KSRSPL			

Specify paper width with appropriate code: SR8.5L, SR9.0L, SR9.5L, SR12L; KSR8.5L, KSR9.0L, KSR9.5L, KSR9.5L, KSR12L; MSR8.5L, MSR9.0L, MSR9.5L, MSR12L; ASR8.5L, ASR8.5L, ASR9.0L, ASR9.5L, ASR12L.

HIGH-SPEED SERVICE

High-Speed Service permits non-conversational, 2000 and 4800 baud I/O on MARK III Foreground. Card and tape input, and printer, punched card and tape output are available. In addition, considerable user intervention is possible for more complete control of your job.

RPS III Service makes available a print station operating at 4800 baud.

Terminals currently validated for HSS include:

DATA 100 Models 70-1, 70-2 and 78-1
IBM 2780 Models 1 and 2
IBM 1130 Models 2 and 3
MDS System 2400 with 2780 Extended Emulator (TA 2800) release 4.0 (with patches).
SCS REMCOM 2780
Honeywell 115

With appropriate communications adaptor and a G.E.-provided software package, High-Speed Service is compatible for use with IBM 360 (Models 22 and up) and IBM 370 (all models) computers using OS, VS, or DOS software.

High-Speed Service is available by dialing one of the following toll free numbers:

COMPUTER ACCESS

	2000 BAUD	4800 BAUD
Continental U.S. (except Ohio):	800-321-9970	800-321-1010
Ohio	800-362-2989	800-362-9400

1200 BAUD SERVICE

1200 Baud Service allows MARK III Foreground system access via 1200 baud terminals, and is intended primarily for users with large volume output applications who do not require the faster, non-interactive transmission of HSS. Paper tape and keyboard input, and CRT display and printed output are available. Paper tape output is also available at 30 characters per second. Special software automatically checks parity of ASCII characters transmitted between the system and your terminal.

Terminals supported by 1200 Baud Service include:

TermiNet 1200
Hazeltine 2000 Video Display Terminal
Dataspeed® 40

1200 Baud Service is available by dialing one of the following toll free numbers. These numbers are subject to change to improve service. To get an up-to-date listing at any time, at no charge, access the Network with Immediate Run User Number VKK66777, NUMBERS.

LOCATION	COMPUTER ACCESS	LOCATION	COMPUTER ACCESS
Alabama	800-241-4178	Nebraska	800-527-2220•
Arizona	800-421-1113	Nevada	800-421-1113•
Arkansas	800-527-2220	New Hampshire	800-321-9390•
California (exc. L.A.)	800-261-1376•	New Jersey	800-638-6870•
L.A.	213-776-7571•	New Mexico	800-421-1113•
Colorado	800-421-1113•	New York (exc. N.Y.C.	
Connecticut	800-321-9390•	& Schtdy.)	800-342-6261
District of Columbia	301-652-7243•	N.Y.C.	212-564-9530
Delaware	800-638-6870•	Schtdy.	518-370-7060
Florida	800-241-4178•	North Carolina	800-241-4178•
Georgia (exc. Atlanta)	800-282-4536•	Ohio (exc. Brk. Park)	800-621-1074•
Atlanta	404-875-0611•	Brk. Park	216-265-6434
Idaho	800-421-1113•	Oklahoma	800-527-2220•
Illinois (exc. Chicago)	800-972-1021•	Oregon	800-421-1113•
Chicago	312-372-8360•	Pennsylvania	800-638-6870•
Indiana	800-621-1074•	Rhode Island	800-321-9390•
Iowa	800-621-1074•	South Carolina	800-241-4178•
Kansas	800-527-2220•	Tennessee	800-241-4178•
Kentucky	800-621-1074•	Texas (exc. Dallas)	800-492-2830
Louisiana	800-527-2220•	Dallas	214-521-8460
Maine	800-321-9390•	Utah	800-421-1113•
Maryland (exc. D.C.)	800-492-6830	Vermont	800-321-9390•
D.C. area	301-652-7243•	Virginia (exc. D.C.)	800-638-6870•
Massachusetts	800-321-9390•	D.C. area	301-652-7243•
Michigan	800-621-1074•	West Virginia	800-638-6870•
Minnesota	800-621-1074•	Washington (state)	800-421-1113•
Mississippi	800-241-4178•	Wisconsin	800-621-1074•
Missouri	800-621-1074•	Wyoming	800-421-1113•

For quick reference, cards containing sign-on and error recovery procedures for each of the terminals mentioned in the High-Speed and 1200 Baud Service descriptions are available from your sales representative.

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COMPUTER ACCESS

RHODE ISLAND

PROVIDENCE	(401) 351-0840

SOUTH CAROLINA

AIKEN	(803) 648-2676
ANDERSON	(803) 225-1676
CHARLESTON	(803) 722-3388
CLEMSON	(803) 654-2433
COLUMBIA	(803) 256-4315
GREENVILLE	(803) 242-3485
GREENWOOD	(803) 229-0464
ROCK HILL	(803) 327-6148
SPARTANBURG	(803) 585-8771

TENNESSEE

CHATTANOOGA	(615) 267-4581
COOKEVILLE	(615) 528-5445
KINGSPORT	(615) 246-7444
KNOXVILLE	(615) 546-6513
JACKSON	(901) 423-9001
LAWRENCEBURG	(615) 762-6471
MEMPHIS	(901) 527-9316
MURFREESBORO	(615) 893-3734
NASHVILLE	(615) 244-6262

TEXAS

AMARILLO	(806) 376-5355
AUSTIN	(512) 476-6046
BROWNSVILLE	(512) 542-9175
CORPUS CHRISTI	(512) 888-4421
DALLAS	(214) 522-5210
EL PASO	(915) 532-1631

Customers may secure 24-hour user support by dialing 800-638-2960.

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COMPUTER ACCESS

TEXAS

GRAND PRAIRIE	(214) 263-5271
HOUSTON	(713) 223-5474
LUFKIN	(713) 634-2502
MARSHALL	(214) 938-8361
MIDLAND	(915) 563-0355
ORANGE	(713) 886-8601
PORT LAVACA	(512) 552-6706
PORT NECHES	(713) 727-3591
SAN ANGELO	(915) 655-6915
SAN ANTONIO	(512) 224-4425
SEMINOLE	(915) 758-5873
SHERMAN	(214) 893-4648
SNYDER	(915) 573-8531
TERMINAL	(915) 563-0355
TYLER	(214) 595-2465

UTAH

OGDEN	(801) 621-4910
SALT LAKE CITY	(801) 521-7220

VERMONT

BRATTLEBORO	(802) 257-0571
BURLINGTON	(802) 658-0110
MONTPELIER	(802) 223-2316
SPRINGFIELD	(802) 885-5721

VIRGINIA

BLACKSBURG	(703) 951-3550
CHARLOTTESVILLE	(804) 977-2022
CHESTER	(804) 748-6406
CRAIGSVILLE	(703) 997-5592
HARRISONBURG	(703) 434-1786
HERNDON	(703) 437-0500
LYNCHBURG	(804) 845-3441
MARTINSVILLE	(703) 632-9705
NEWPORT NEWS	(804) 244-0141
NORFOLK	(804) 623-9171
PULASKI	(703) 980-5904

Customers may secure 24-hour user support by dialing 800-638-2960.

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	COMPUTER ACCESS
VIRGINIA (Continued)	
RICHMOND	(804) 644-4161
ROANOKE	(703) 345-1092
WAYNESBORO	(703) 942-0181
WASHINGTON	
BREMERTON	(206) 479-2565
EVERETT	(206) 355-2511
LONGVIEW	(206) 425-7010
OLYMPIA	(206) 943-5200
SEATTLE	(206) 575-2950
SPOKANE	(509) 326-9400
TACOMA	(206) 927-0104
WEST VIRGINIA	
BECKLEY	(304) 255-1491
BLUEFIELD	(304) 325-3944
CHARLESTON	(304) 344-3546
WHEELING	(304) 232-8600
WISCONSIN	
APPLETON	(414) 739-0244
MADISON	(608) 257-0245
MILWAUKEE	(414) 271-7980
RACINE	(414) 637-9721
WYOMING	
CASPER	(307) 265-3760

ıstomers may secure 24-hour user support by dialing
)0-638-2960.

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SALES DIRECTORY

To telephone the G.E. Information Services sales representative or authorized distributor nearest you, find the city closest to you in the following listings, and dial the telephone number for that location.

UNITED STATES	TELEPHONE
ALBUQUERQUE, N.M.	(505) 298-7591
ATLANTA, GA.	(404) 393-0020
BALTIMORE, MD.	(301) 539-6970
BETHESDA, MD.	(301) 654-7061
BINGHAMPTON, N.Y.	(607) 772-0546
BIRMINGHAM, ALA.	(205) 933-2670
BOSTON, MASS.	(617) 926-2911
BUFFALO, N.Y.	(716) 839-5222
CHARLOTTE, N.C.	(704) 374-1783
CHICAGO, ILL.	(312) 663-3900
CINCINNATI, OHIO	(513) 559-3660
CLEVELAND, OHIO	(206) 398-5060
COLUMBUS, OHIO	(614) 438-2170
DALLAS, TEXAS	(214) 631-0910
DENVER, COLO.	(303) 388-5751
DETROIT, MICH.	(313) 968-8100
EAST ORANGE, N.J.	(201) 672-0700
ENCINO, CALIF.	(213) 872-3215
FORT WAYNE, IND.	(219) 743-7431
GREENSBORO, N.C.	(919) 292-7230
GREENVILLE, S.C.	(803) 233-5335
HARRISBURGH, PA.	(717) 761-1481
HARTFORD, CONN.	(203) 289-7941
HOUSTON, TEXAS	(713) 771-7292
INDIANAPOLIS, IND.	(317) 545-7591
JACKSONVILLE, FLA.	(904) 725-7100
KANSAS CITY, MO.	(816) 842-9745
LOS ANGELES, CAL.	(213) 385-9411
LOUISVILLE, KY.	(502) 452-4211
MIAMI, FLA.	(305) 621-1196
MILWAUKEE, WISC.	(414) 271-7900
MINNEAPOLIS, MINN.	(612) 544-6699
NASHVILLE, TENN.	(615) 259-4570
NEW YORK, N.Y.	(212) 997-0300

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TELEPHONE (left column)

TED STATES (Continued)

KLAHOMA CITY, OKLA.	(405) 947-2376
ILO ALTO, CAL.	(415) 969-3772
IILADELPHIA, PA.	(215) 864-7474
IOENIX, ARIZ.	(602) 264-7881
TTSBURGH, PA.	(412) 288-9300
TTSFIELD, MASS.	(413) 494-4308
IRTLAND, ORE.	(503) 288-6915
CHMOND, VA.	(804) 320-0192
ICHESTER, N.Y.	(716) 232-6523
IN FRANCISCO, CAL.	(415) 989-1100
IHENECTADY, N.Y.	(518) 372-6436
ATTLE, WASH.	(206) 575-2990
IREVEPORT, LA.	(318) 425-2476
. LOUIS, MO.	(314) 342-7780
AMFORD, CONN.	(203) 359-2985
IOSSET, N.Y.	(516) 921-9521
IRACUSE, N.Y.	(315) 456-1995
IMPA, FLA.	(813) 877-8294
ILSA, OKLA.	(918) 582-0800
ISHINGTON, D.C.	(202) 628-4000

de the United States, MARK III service is available
gh our authorized Distributors.

TRALIA

MANAGER, TIME-SHARING
HONEYWELL INFORMATION SYSTEMS
863 BOURKE STREET
WATERLOO, NSW 2017   69.0355

MANAGER, TIME-SHARING
HONEYWELL INFORMATION SYSTEMS
350 ST. KILDA ROAD
MELBOURNE, VICTORIA 3004   699-3288

puter access numbers for the cities indicated are
ible on request by calling the listed customer service
ier.

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TELEPHONE (right column)

AUSTRALIA

CANBERRA	49-4844
SYDNEY	69-0355
MELBOURNE	699-3288
ADELAIDE	42-7966

AUSTRIA

SALES MANAGER, TIME-SHARING
HONEYWELL BULL
LINKE WIENZEILE 236
A-1150 VIENNA   85-36-41

VIENNA   85-36-41

BELGIUM

SALES MANAGER, TIME-SHARING
GENERAL TIME-SHARE S.A.
AVENUE DES ARTS 56
1040 BRUSSELS   511.07.40

BRUSSELS   511.07.40

CANADA

INFORMATION SERVICES HEADQUARTERS
CANADIAN GENERAL ELECTRIC CO. LTD.
1420 DUPONT STREET
TORONTO M6H 2B2, ONTARIO (416) 534-6511

ALBERTA

CALGARY	(403) 266-7311
EDMONTON	(403) 429-6757
WINNEPEG	(403) 266-7311

BRITISH COLUMBIA

VANCOUVER	(604) 681-8136

Computer access numbers for the cities indicated are
available on request by calling the listed customer service
number.

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NADA (Continued)

NEW BRUNSWICK

SAINT JOHN	(506) 696-5920

ONTARIO

OTTAWA	(613) 238-5665
TORONTO	(416) 361-1144
HAMILTON	(416) 534-6511

QUEBEC

MONTREAL	(514) 866-1884

NMARK

T/S MANAGER
ØK DATA
17, GRONNINGEN
1270 COPENHAGEN K. DENMARK 01 12 32 00

COPENHAGEN	01 12 32 00

LAND

SALES MANAGER, TIME SHARING
OY NOKIA AB
ELEKTRON III KKA
POSTILOKERO 780
00101 HELSINKI 10   66-19-91

HELSINKI	66-19-91

ANCE

SALES MANAGER, TIME SHARING
COMPAGNIE HONEYWELL BULL
179-181 AV. CHARLES DE GAULLE
92532 NEUILLY   747-7042

puter access numbers for the cities indicated are
able on request by calling the listed customer service
ber.

FRANCE

BORDEAUX	(15) 56 90 91 30
LE HAVRE	(16) 35 98 18 98
LILLE	(16) 20 52 07 13
RENNES	(15) 40 73 32 40
NANTES	(15) 40 73 32 40
LYON	(15) 78 28 56 82
MARSEILLE	(15) 91 77 88 83
NANCY	(15) 28 27 01 95
NICE	(15) 91 77 88 83
PARIS	747-7042
ROUEN	(16) 35 98 18 98
STRASBOURG	(15) 28 27 01 95
TOULOUSE	(15) 56 44 62 73
CLERMONT FERRAND	747-7042
MAUBERGE	747-7042

IRELAND

SALES MANAGER, TIME SHARING
HONEYWELL INFORMATION SYSTEMS LTD.
114-118 SOUTHAMPTON ROW

LONDON, WC1B5A8, UK	242-5725
DUBLIN	061-485-6116

ITALY

TIME-SHARING MANAGER
HONEYWELL INFORMATION SYSTEMS ITALIA
TAZZOLI 6

20154 MILAN	669-861
BOLOGNA	277-881
FLORENCE	688-8541
MILAN	688-8541
NAPLES	688-8541
PADUA	662-911
ROME	479-051
TURIN	540-056

Computer access numbers for the cities indicated are
available on request by calling the listed customer service
number.

ITALY (Continued)

GENOA	688-8541
BRESCIA	669-861
PALERMO	669-861

JAPAN

SALES MANAGER, TIME SHARING
DENTSU ADVERTISING, LTD.
11,1-CHOME, TSUKIJI, TOKYO. 104

NAGOYA	(052) 251-8111
OSAKA	(06) 203-1201
TOKYO	(03) 544-7257
YOKOHAMA	(03) 544-7257
HIROSHIMA	(03) 544-7257

NETHERLANDS

SALES MANAGER, TIME SHARING
HONEYWELL BULL (NEDERLAND) N.V.
VLIEGTUIGSTRAAT 26

AMSTERDAM	020-158955
THE HAGUE	158955

NORWAY

SALES MANAGER, TIME SHARING
HONEYWELL BULL AS
ROALDMUNDSENS GATE 2
POST BOKS 1315

OSLO 2	42-38-30
OSLO	42-38-30

PUERTO RICO

INTERNATIONAL ACCOUNTS MANAGER
GENERAL ELECTRIC COMPANY
INFORMATION SERVICES BUSINESS DIVISION

ROCKVILLE, MD. 20850	(301) 340 4472
SAN JUAN	

Computer access numbers for the cities indicated are available on request by calling the listed customer service number.

SWEDEN

SALES MANAGER, TIME SHARING
HONEYWELL BULL AB
BOX 23137

S-10435 STOCKHOLM 23	08-24 66 20
STOCKHOLM	08-24 66 20
GOTEBORG	031-12 42 35
MALMO	040-18 12 70

SWITZERLAND

TIME-SHARING MANAGER
HONEYWELL BULL (SCHWEIZ) AG
HARDTURMSTRASSE 253

CH8005 ZURICH	44.49.40
ZURICH	44.49.40
GENEVA	44.49.40

UNITED KINGDOM

SALES MANAGER, TIME SHARING
HONEYWELL INFORMATION SYSTEMS LTD.
114-118 SOUTHAMPTON ROW

LONDON, WC 1B5A8	242-5725

ENGLAND

BIRMINGHAM	021-373-8144
LEEDS	061-485-6116
LIVERPOOL	061-485-6116
LONDON	(01) 242-5725
MANCHESTER	061-485-6116
NEWCASTLE	0385-63021
SOUTHAMPTON	(01) 242-5725
LOUGHBOROUGH	242.5725

Computer access numbers for the cities indicated are available on request by calling the listed customer service number.

ENGLAND (Continued)

SCOTLAND

EDINBURGH	041-882-6244
GLASGOW	041-882-6244

WALES

CARDIFF	0272-292831/5

WEST GERMANY

SALES MANAGER, INFORMATION SERVICES
HONEYWELL BULL GmbH
HOHENSTAUFENRING 62

5000 KOLN 1	203.7351

COLOGNE	02 21-20371
FRANKFURT	06196-4711
HAMBURG	040-2201376
MUNICH	089-530421
STUTTGART	0711-299101
DUSSELDORF	203-7351

Computer access numbers for the cities indicated are available on request by calling the listed customer service number.

> **To get a free, up-to-date list of changes to user access numbers, access the network with Immediate Run User Number VHA03000.**
>
> **To get a free, up-to-date list of 1200 baud access numbers, access the network with Immediate Run User Number VKK66777, NUMBERS.**

Mr. Robert Colten
INPUT
2180 Sand Hill Road, Suite 320
Menlo Park, California 94025

Paris, February 4, 1977

Dear Mr. Colten,

Following your request by letter 25th, please find here
enclosed the European rates for Mark III services.

Those rates are the same whatever the center where data are
sent to or computed in. So the supercenter, officially opened
February 1st in Amsterdam, does not affect in any way the
European rates.

Please feel free to call on us if you need any other information.

Sincerely,
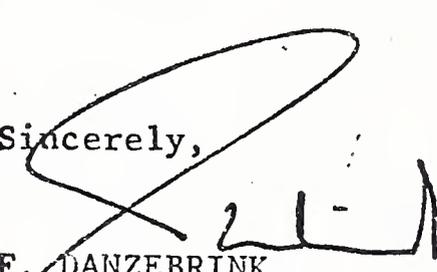
F. DANZEBRINK

International Accounts Manager

Enc.

Honeywell

MARK III PRICES

Country : AUSTRIA
Currency : Schilling
Revision : November 1976

I – FOREGROUND
1) 110 – 300 BAUDS SERVICE

ON	TCH	KCH	CRU	PSU	DSU	HSU
A	0 - 20 — 304.00 20 — 210.00	7.60	0 - 3200 — 4.10 >3200 — 3.40	38.00	23.00	23.00
B	350.00	0 - 500 — 5.80 >500 — 3.50	0 - 2000 — 4.55 >2000 — 4.10	33.00	0 - 200 — 14.00 >200 — 7.00	3.70
	0 - 15 — 350.00 15 45 — 294.00 >45 — 210.00	0 - 250 — 7.60 250 - 750 — 5.60 >750 — 2.70	0 - 2000 — 4.55 2000 6000 — 4.10 >6000 — 3.40	0 - 180 — 38.00 180 - 540 — 34.20 >540 — 28.50	0 - 90 — 23.00 90 - 270 — 15.60 >270 — 4.60	3.70
	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

International Accounts - F. Danzebrink
HB NIS - Tour Atlantique
92080 - Paris la Défense - Cedex 06
tél. 776 44 92 - tlx. 611764 F

FEB 9 1977

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MARK III PRICES

HONEYWELL INFORMATION SERVICES GMBH
Linke Wienzeile

1 - 1150 - WIEN (Austria)

tel. (0222) 85.36.41

tlx 012743 HOBULL A

Country : AUSTRIA
Currency : Schilling
Revision : November 1976

I - F O R E G R O U N D
   1) 110 - 300 BAUDS SERVICE

ON	TCH	KCH	CRU	PSU	DSU	HSU
A	0 - 20 304.00 20 210.00	7.60	0 - 3200 4.10 > 3200 3.40	38.00	23.00	23.00
B	350.00	0 - 500 5.80 > 500 3.50	0 - 2000 4.55 > 2000 4.10	33.00	0 - 200 14.00 > 200 7.00	3.70
	0 - 15 350.00 15 45 294.00 > 45 210.00	0 - 250 7.60 250 - 750 5.60 > 750 2.70	0 - 2000 4.55 2000 · 6000 4.10 > 6000 3.40	0 - 180 38.00 180 - 540 34.20 > 540 28.50	0 - 90 23.00 90 - 270 15.60 > 270 4.60	3.70
	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

2) 1 200 BAUDS SERVICE :

    PLAN 1   TCT   : 1 120.00
                         KCH   :   NC

    PLAN 2   TCT   :   560.00
                         KCH   :   5.60

3) 2 400 - 4 800 BAUDS SERVICE :

                         TCH   :   600.00
                         INPUT/OUTPUT   :   5.60   /100 records

II – B A C K G R O U N D :

1)   G C O S :

CRU (Computer Resource Unit)   : 10 200.00
DSU (Data Storage Unit)   :   3.36
Magnetic Tape Storage/reel month :   93.00
Tape mount   :   - secured   :
                     - unsecured   :

2)   V S :

CRU (Computer Resource Unit)   :
ISU (Information Storage Unit)   :
Removable disc/month 3336   :
    "   "   " 2316   :
Disc mount   :
Magnetic tape : reel month   :
Tape mount   :

III – M I S C E L L A N E O U S

FIXED CHARGES :

1. Initial fees Mark III   : 3 800.00
2. Minimum monthly charge   : 6 300.00
3. Minimum charge per invoice   :
4. Archival administration charges :

    Archival storage   :   160.00   per file/operation
    Archival retrieve   :   320.00   per file/operation
    ASU Archival Storage Unit   :   0.70   per storage unit/
                                                 month

. Administrative charges for modifications :

a) For each modification, addition or cancellation of the customer code :
- by operation   :   630.00
- minimum per operation   : 1 260.00

b) For restauration of customer programs :
- by program (in the fortnight that follows its
  date of deleting on the disc)   :   370.00
- by program (between 15 days and 6 months)   :   510.00
- minimum charge by operation   :   750.00

No restauration after 6 months.

c) File transfer :
- per file   :   75.00
- minimum per operation   :   370.00
- maximum per operation   : 1 860.00

d) for another option, per change   : 1 260.00

IV - M E D I A   C O N V E R S I O N   S E R V I C E S

Disc to tape   :

Tape to disc   :

Disc to printer (1 part)   :   110.00 /1000 lines

Disc to printer (2 to 3 part)   :   140.00 /1000 lines

Card to disc   :   175.00 /1000 cards

Disc to punch   :   350.00 /1000 cards

Minimum per job   :   390.00

Cards and paper are included in the tariff.

Freight and communication to or from MCS center and all other accessory costs
are charged to the customer in addition to above cost.

MARK III PRICES

GENERAL TIME SHARE S.A.
56, avenue des Arts
B – 1040 – BRUXELLES
(Belgique)

tel. (02) 511 07 40
tlx. 23697 BUGLI BRU

Country : BELGIUM
Currency : Francs
Revision : November 1976

I - F O R E G R O U N D
1) 110 – 300 BAUDS SERVICE

ION	TCH	KCH	CRU	PSU	DSU	HSU
A	0 - 20 675.00 20 466.00	17.25	0 – 3200 9.00 > 3200 7.50	83.00	51.00	50.00
B	777.00	0 – 500 12.75 > 500 8.00	0 – 2000 10.00 > 2000 9.00	73.00	0 – 200 31.25 > 200 15.00	8.50
C	0 – 15 777.00 15 - 45 652.00 > 45 466.00	0 – 250 17.25 250 – 750 12.75 > 750 6.00	0 2000 10.00 2000 6000 9.25 > 6000 7.50	0 – 180 83.00 180 – 540 75.00 > 540 62.00	0 – 90 51.00 90 – 270 34.50 > 270 10.50	8.50
	675.00	NC	10.00	88.00	54.50	8.50

2) 1 200 BAUDS SERVICE :

PLAN 1	TCT	: 2 185.00	
	KCH	:	NC
PLAN 2	TCT	: 1 092.00	
	KCH	: 11.25	

3) 2 400 - 4 800 BAUDS SERVICE :

TCH	: 1 163.00	
INPUT/OUTPUT	: 14.50	/100 records

II - B A C K G R O U N D :

1) G C O S :

CRU (Computer Resource Unit)	: 20 321.00
DSU (Data Storage Unit)	: 6.50
Magnetic Tape Storage/reel month	: 182.00
Tape mount : - secured	:
- unsecured	:

2) V S :

CRU (Computer Resource Unit)	: 21 773.00
ISU (Information Storage Unit)	: 60.00
Removable disc/month 3336	: 5 443.00
" " " 2316	: 2 177.00
Disc mount	: 728.00
Magnetic tape : reel month	: 182.00
Tape mount	: 73.00

III - M I S C E L L A N E O U S

FIXED CHARGES :

1. Initial fees Mark III	: 7 394.00	
2. Minimum monthly charge	: 7 394.00	
3. Minimum charge per invoice	:	
4. Archival administration charges	:	
Archival storage	: 404.00	per file/operation
Archival retrieve	: 809.00	per file/operation
ASU Archival Storage Unit	: 1.75	per storage unit/ month

5. Administrative charges for modifications :

   a) For each modification, addition or cancellation of the customer code :
     – by operation   : 1 264.00
     – minimum per operation   : 2 529.00

   b) For restauration of customer programs :
     – by program (in the fortnight that follows its
       date of deleting on the disc)   :   708.00
     – by program (between 15 days and 6 months) : 1 012.00
     – minimum charge by operation   : 1 416.00

No restauration after 6 months.

   c) File transfer :
     – per file   :   152.00
     – minimum per operation   :   708.00
     – maximum per operation   : 3 540.00

   d) for another option, per change   : 2 529.00

IV – MEDIA CONVERSION SERVICES

Disc to tape	:	
Tape to disc	:	
Disc to printer (1 part)	: 405.00	/1000 lines
Disc to printer (2 to 3 part)	: 506.00	/1000 lines
Card to disc	: 405.00	/1000 cards
Disc to punch	: 809.00	/1000 cards
Minimum per job	: 809.00	

Cards and paper are included in the tariff.

Freight and communication to or from MCS center and all other accessory costs are charged to the customer in addition to above cost.

PRICES IN DENMARK, EFFECTIVE: NOV. 1, 1976,   MONEY: DK

K*   09/13/76

:ial Charge   Initial Charge Paid on signing   kr. 1.500,00

 Charges   Usage is accounted for by project number
              and by type on a month to month basis:

	Per Unit	Step 1 kr.	Step 2 kr.	Step 3 kr.
-minal Connect Hours (TCH)	Hour	120,00	85,00	70,00
out/Output Characters (KC)	1000 ch.	2,10	1,50	1,00
mputer Resource Units (CPU)	CPU	1,50	0,95	0,75
gram Storage Units (PSU)	Month	11,00	8,00	5,50
ta Storage Units (DSU)	Month	3,00	2,00	1,50
sam Storage Units (HSU)	Month	1,50	1,00	0,75

 applicable steps are:

it	Step 1	Step 2	Step 3
H	0 - 20	20 - 50	50 and over
	0 - 500	500 - 1.500	1.500 and over
U	0 - 4.000	4.000 - 7.000	7.000 and over
U	0 - 200	200 - 500	500 and over
U	0 - 200	200 - 500	500 and over,
U	0 - 200	200 - 500	500 and over

f-line, ASU per month   kr.   0,20
ansfer to off-line   -   45,00
ansfer from off-line   -   90,00

mote Media Service (High Speed Printer and Punch Card Reader)

	Step 1	Step 2
0 records	kr. 7,50	kr. 5,00

ep 1: 0 - 10.000 records per job.
ep 2: 10.000 and over records per job.
nimum per job kr. 270,00.

eral
-----

nimum monthly charge kr. 500,00
e above minimum charge is to be effective from the end of the third
lendar month after subscription.
ove prices are exclusive V.A.T.

BACKGROUND PRICELIST

	Per Unit	nbr.
round Input and output through Foreground		
Processortime:	CPU	2.700,00
Tape mount		
Unsecured tape	Piece	35,00
Secured tape	Piece	20,00
Storage:		
Rental of on-line disc	320 Word/Month	0,00
Rental of tape	Piece/Month	36,00
Processortime:	CPU	2.700,00
Tape mount	Piece	20,00
Removable disc mount	Piece	90,00
Storage,, rental of:		
On-line disc	13030 characters per month	7,50
Removable disc, 3336	Piece/Month	675,00
Removable disc, 2316	Piece/Month	280,00
Tape	Piece/Month	36,00

Valid as of 1976-11-01.

TERMINAL PRICELIST

Rental per month:
Delivery of terminal and/or terminal equipment   kr. 750,00

	Standard kr.	12 Months kr.	36 Months kr.
TermiNet 300	1.970,00	1.635,00	1.400,00
Reader/Punch Unit	870,00	710,00	600,00
Silent 733 ASR (dual cassette)	1.675,00	1.450,00	1.200,00

Termination of rental subject to following advance notice:

standard rental 1 month's notice.

12 month's rental 3 month's notice, but not until after 12 month's rental.

36 month's rental 3 month's notice, but not until after 36 month's rental.

Rental charges are inclusive service.

Purchase:

TermiNet 300	kr. 33.785,00
Reader/Punch Unit, GNT model 40	kr. 15.800,00
Silent 733 ASR (dual cassette)	kr. 27.050,00

Above prices relate to new equipment and are inclusive delivery.

Above prices are exclusive V.A.T.
At delivery terminals are provided with paper etc.

Valid from 1976-11-01.

International Accounts - F. Danzebrink
HB NIS - Tour Atlantique
92080 - Paris la Défense - Cedex 06
tél. 776 44 92 - tlx. 611764 F.

Honeywell

MARK III PRICES

OY NOKIA AB
Laskentaskeskus - Opastinsilta 8E
00520 Helsinki 52

(tel. 14.00.22)

Country : FINLAND
Currency : MARK
Revision : NOVEMBER 1976

I - FOREGROUND
1) 110 - 300 BAUDS SERVICE

ION	TCH	KCH	CRU	PSU	DSU	HSU
A	0 - 20 20		0 - 3200 ＞ 3200			
B		0 - 500 ＞ 500	0 - 2000 ＞ 2000		0 - 200 ＞ 200	
C	0 - 15 66.00	0 - 250 1.40	0 - 2000 0.75	0 - 180 6.70	0 - 90 4.10	
	15 - 45 55.00	250 - 750 1.05	2000 - 6000 0.65	180 - 540 6.00	90 - 270 2.80	0.70
	＞ 45 40.00	＞ 750 0.50	＞ 6000 0.55	＞ 540 5.00	＞ 270 0.80	
D						

2) 1 200 BAUDS SERVICE :

    PLAN 1   TCT   :
                          KCH   :   NC

    PLAN 2   TCT   :
                          KCH   :

3) 2 400 - 4 800 BAUDS SERVICE :

                      TCH   :
                      INPUT/OUTPUT   :   /100 records

II – B A C K G R O U N D :

1)   G C O S :

    CRU (Computer Resource Unit)   : 2 060.00
    DSU   (Data Storage Unit)   :   0.60
    Magnetic Tape Storage/reel month   :
    Tape mount   :   – secured   :
                     – unsecured :

2)   V S :

    CRU (Computer Resource Unit)   :
    ISU (Information Storage Unit)   :
    Removable disc/month 3336   :
      "   "   " 2316   :
    Disc mount   :
    Magnetic tape : reel month   :
    Tape mount   :

III – M I S C E L L A N E O U S

FIXED CHARGES :

    1. Initial fees Mark III   :   400.00
    2. Minimum monthly charge   :
    3. Minimum charge per invoice   :   50.00
    4. Archival administration charges :

        Archival storage   :   30.00   per file/operation
        Archival retrieve   :   60.00   per file/operation
        ASU Archival Storage Unit   :   0.15   per storage unit/
                                                month

International Accounts - F. Danzebrink
HB NIS - Tour Atlantique
92080 - Paris la Défense - Cedex 06
tél. 776 44 92 - tlx. 611764 F

Honeywell

MARK III PRICES

HB NETWORK INFORMATION SERVICES
Tour Atlantique
92080 - PARIS LA DEFENSE
Cedex 06

tel. (1) 776.44.92
tlx. 661 764 F HBNISPA

Country : FRANCE
Currency : franc
Revision : November 1976

I - FOREGROUND
1) 110 - 300 BAUDS SERVICE

ION	TCH	KCH	CRU	PSU	DSU	HSU
A	0 - 20 75.60 20 52.30	1.95	0 - 3200 1.00 >3200 0.84	9.30	5.70	0.92
B	87.20	0 - 500 1.47 > 500 0:90	0 - 2000 1.13 > 2000 1.00	8.20	0 - 200 3.50 >200 1.70	0.92
C	0 - 15 87.20 15 - 45 73.20 > 45 52.30	0 - 250 1.95 250 - 750 1.43 > 750 0.67	0 - 2000 1.13 2000 - 6000 1.00 > 6000 0.84	0 - 180 9.30 180 - 540 8.40 > 540 7.00	0 - 90 5.70 90 - 270 3.85 > 270 1.13	0.92
)	75.60	NC	1.13	9.90	6.10	0.92

2) 1 200 BAUDS SERVICE :

PLAN 1   TCT   :   300.00
                     KCH   :   NC

PLAN 2   TCT   :   150.00
                     KCH   :   1.50

3) 2 400 – 4 800 BAUDS SERVICE :

                     TCH   :   150.00
                     INPUT/OUTPUT   :   1.85   /100 records

II – B A C K G R O U N D :

1)   G C O S :

CRU (Computer Resource Unit)   : 2 540.00
DSU   (Data Storage Unit)   :   1.50
Magnetic Tape Storage/reel month   :   23.00
Tape mount   :   – secured   :   9.00
                    – unsecured   :

2)   V S :

CRU (Computer Resource Unit)   : 2 705.00
ISU (Information Storage Unit)   :   7.30
Removable disc/month 3336   :   677.00
     "   "   "   2316   :   270.00
Disc mount   :   90.00
Magnetic tape : reel month   :   23.00
Tape mount   :   9.00

III – M I S C E L L A N E O U S

FIXED CHARGES :

1. Initial fees Mark III   :   910.00
2. Minimum monthly charge   : 1 000.00
3. Minimum charge per invoice   :
4. Archival administration charges   :

Archival storage   :   40.00   per file/operation
Archival retrieve   :   82.00   per file/operation
ASU Archival Storage Unit   :   0.17   per storage unit/
                                                       month

5. Administrative charges for modifications :

  a) For each modification, addition or cancellation of the customer code :

    – by operation   :   155.00

    – minimum per operation   :   310.00

  b) For restauration of customer programs :

    – by program (in the fortnight that follows its
date of deleting on the disc)   :   92.00

    – by program (between 15 days and 6 months)   :   128.00

    – minimum charge by operation   :   184.00

No restauration after 6 months.

  c) File transfer :

    – per file   :   33.00

    – minimum per operation   :   165.00

    – maximum per operation   :   825.00

  d) for another option, per change   :   155.00

IV.- MEDIA CONVERSION SERVICES

Disc to tape	:	
Tape to disc	:	
Disc to printer (1 part)	:	49.00 /1000 lines
Disc to printer (2 to 3 part)	:	55.00 /1000 lines
Card to disc	:	49.00 /1000 cards
Disc to punch	:	98.00 /1000 cards
Minimum per job	:	105.00

Cards and paper are included in the tariff.

Freight and communication to or from MCS center and all other accessory costs are charged to the customer in addition to above cost.

International Accounts – F. Danzebrink
HB NIS – Tour Atlantique
92080 – Paris la Défense – Cedex 06
tél. 776 44 92 – tlx. 611764 F

Honeywell

MARK III PRICES

Honeywell Information Services
Luxemburger Str. 299
5000 – KOELN 41

tel. (0221) 41.40.91

Country : GERMANY

Currency : Mark

Revision : November 1976

I – F O R E G R O U N D
  1) 110 – 300 BAUDS SERVICE

ON	TCH	KCH	CRU	PSU	DSU	HSU
A	0 – 20 38.00 20 28.00	0.95	0 – 3200 0.55 > 3200 0.45	4.90	2.95	2.95
B	45.00	0 – 500 0.75 > 500 0.45	0 – 2000 0.60 > 2000 0.55	4.25	0 – 200 1.90 > 200 0.95	0.48
	0 – 15 45.00 15 – 45 38.00 > 45 27.00	0 – 250 0.95 250 – 750 0.70 > 750 0.33	0 – 2000 0.60 2000 – 6000 0.55 > 6000 0.45	0 – 180 4.90 180 – 540 4.40 > 540 3.65	0 – 90 2.95 90 – 270 2.00 > 270 0.60	0.48
	38.00	NC	0.60	5.20	3.15	0.48

2) 1 200 BAUDS SERVICE :

PLAN 1	TCT	:	116.00	
	KCH	:		NC
PLAN 2	TCT	:	58.00	
	KCH	:	0.58	

3) 2 400 - 4 800 BAUDS SERVICE :

TCH	:	62.00	
INPUT/OUTPUT	:	0.77	/100 records

II - B A C K G R O U N D :

1) G C O S :

CRU (Computer Resource Unit)	:	1 080.00
DSU (Data Storage Unit)	:	0.35
Magnetic Tape Storage/reel month	:	10.00
Tape mount : - secured	:	4.00
- unsecured	:	10.00

2) V S :

CRU (Computer Resource Unit)	:	1 160.00
ISU (Information Storage Unit)	:	3.10
Removable disc/month 3336	:	290.00
" " " 2316	:	115.00
Disc mount	:	40.00
Magnetic tape : reel month	:	10.00
Tape mount	:	4.00

III - M I S C E L L A N E O U S

FIXED CHARGES :

1. Initial fees Mark III	:	500.00	
2. Minimum monthly charge	:	500.00	
3. Minimum charge per invoice	:	500.00	
4. Archival administration charges	:		
Archival storage	:	25.00	per file/operation
Archival retrieve	:	50.00	per file/operation
ASU Archival Storage Unit	:	0.10	per storage unit/ month

5. Administrative charges for modifications :

a) For each modification, addition or cancellation of the customer code :
   - by operation   : 80.00
   - minimum per operation   : 160.00

b) For restauration of customer programs :
   - by program (in the fortnight that follows its
     date of deleting on the disc)   : 50.00
   - by program (between 15 days and 6 months)   : 70.00
   - minimum charge by operation   : 100.00

No restauration after 6 months.

c) File transfer :
   - per file   : 10.00
   - minimum per operation   : 50.00
   - maximum per operation   : 250.00

d) for another option, per change   : 160.00

IV - MEDIA CONVERSION SERVICES

Disc to tape	:	
Tape to disc	:	
Disc to printer (1 part)	: 14.00	/1000 lines
Disc to printer (2 to 3 part)	: 18.00	/1000 lines
Card to disc	: 23.00	/1000 cards
Disc to punch	: 46.00	/1000 cards
Minimum per job	: 50.00	

Cards and paper are included in the tariff.

Freight and communication to or from MCS center and all other accessory costs
are charged to the customer in addition to above cost.

International Accounts - F. DANZEBRINK
HB NIS - Tour Atlantique
92080 - PARIS LA DEFENSE

Honeywell

tel. 776.44.92 - tlx. 611764 F

MARK III PRICES

Honeywell Information Systems
Via M. Gioa 70
20124 - MILANO

tel. (2) 68.87.241

Country : Italy

Currency : lire

Revision : December 1976

I - G E N E R A L

1)   Initial Fees   :   100 000

2)   Two types of contracts resulting in two
      different billing prices :

      A. Monthly   commitment for a minimum of   :   50 000 lire/monthly

      B. Monthly   commitment for a minimum of :   250 000 lire/monthly

II – F O R E G R O U N D

1) 110 – 300 BAUDS SERVICE :

	A	B
TCH option 1	9 000	8 000
KCH option 1	250	200
TCH option 2	16 000	14 000
KCH option 2	–	–
CRU	140	130
PSU	1 500	1 400
DSU	400	300
HSU	150	100
ASU	25	20
STORE PER FILE	7 000	6 000
RETRIEVE PER FILE	14 000	12 000

2) 1 200 BAUDS SERVICE :

	A	B
TCH option 1	18 000	15 000
KCH option 1	200	150
TCH option 2	35 000	30 000
KCH option 2	–	–

3) 2 400 BAUDS SERVICE

	A	B
TCH	18 000	15 000
I/O 100 records	200	150

III – B A C K G R O U N D

	A	B
1) **G C O S**		
CRU	400 000	350 000
DSU	120	100
TAPE/REEL/MONTHLY STORAGE	3 000	3 000
TAPE MOUNT NON SECURED	3 600	3 600
TAPE MOUNT SECURED	1 200	1 200
2) **V S**		
CRU	400 000	350 000
ISU	1 200	1 000
DISC PACK 3336/MONTH	90 000	90 000
2316/MONTH	36 000	36 000
DISC MOUNT	12 000	12 000
MAGNETIC TAPE REEL/MONTH	3 000	3 000
TAPE MOUNT	1 200	1 200

IV – M E D I A   C O N V E R S I O N   S E R V I C E S

DISC TO CARD	4	per card
CARD TO DISC	1	per card
PRINT 1 PART	1	per line
PRINT 2 OR 3 PARTS	4	per line
MINIMUM PER JOB	10 000	

Honeywell

MARK III PRICES

Country : NETHERLANDS
Currency : GULDEN
Revision : NOVEMBER 1976

I – F O R E G R O U N D
1) 110 – 300 BAUDS SERVICE

TION	TCH	KCH	CRU	P SU	D SU	HSU
A	0 – 20 . 20		0 – 3200 ❯ 3200			
B		0 – 500 ❯ 500	0 – 2000 ❯ 2000		0 – 200 ❯ 200	
C	0 – 15 42.75 15 – 45 36.00 ❯ 45 25.65	0 – 250 0.90 250 – 750 0.65 ❯ 750 0.30	0 – 2000 0.55 2000 – 6000 0.50 ❯ 6000 0.40	0 – 180 4.65 180 – 540 4.15 ❯ 540 3.45	0 – 90 2.65 90 – 270 1.80 ❯ 270 0.50	0.50
D						

2) 1 200 BAUDS SERVICE :

PLAN 1	TCT	:	136.00	
	KCH	:		NC
PLAN 2	TCT	:	68.00	
	KCH	:	0.68	

3) 2 400 - 4 800 BAUDS SERVICE :

TCH	:	70.00	
INPUT/OUTPUT	:	1.00	/100 records

II - B A C K G R O U N D :

1) G C O S :

CRU (Computer Resource Unit)	:	1 275.00
DSU (Data Storage Unit)	:	0.50
Magnetic Tape Storage/reel month	:	10.00
Tape mount : - secured	:	
- unsecured	:	

2) V S :

CRU (Computer Resource Unit)	:
ISU (Information Storage Unit)	:
Removable disc/month 3336	:
" " " 2316	:
Disc mount	:
Magnetic tape : reel month	:
Tape mount	:

III - M I S C E L L A N E O U S

FIXED CHARGES :

1. Initial fees Mark III	:	250.00	
2. Minimum monthly charge	:	—	
3. Minimum charge per invoice	:	50.00	
4. Archival administration charges	:		
Archival storage	:	22.50	per file/operation
Archival retrieve	:	45.00	per file/operation
ASU Archival Storage Unit	:	0.10	per storage unit/ month

5. Administrative charges for modifications :

   a) For each modification, addition or cancellation of the customer code :

     - by operation   :   6.00
     - minimum per operation   :   30.00

   b) For restauration of customer programs :

     - by program (in the fortnight that follows its date of deleting on the disc)   :   30.00

     - by program (between 15 days and 6 months)   :   45.00

     - minimum charge by operation   :   75.00

No restauration after 6 months.

   c) File transfer :

     - per file   :   6.00

     - minimum per operation   :   30.00

     - maximum per operation   : 150.00

   d) for another option, per change   :

IV – MEDIA CONVERSION SERVICES

Disc to tape	:	
Tape to disc	:	
Disc to printer (1 part)	: 24.50	/1000 lines
Disc to printer (2 to 3 part)	: 28.20	/1000 lines
Card to disc	: 24.50	/1000 cards
Disc to punch	: 48.50	/1000 cards
Minimum per job	: 50.00	

Cards and paper are included in the tariff.

Freight and communication to or from MCS center and all other accessory costs are charged to the customer in addition to above cost.

International Accounts – F. Danzebrink
HB NIS – Tour Atlantique
92080 – Paris la Défense – Cedex 06
tél. 776 44 92 – tlx. 611764 F

Honeywell

MARK III PRICES

Honeywell Information Services A/S
Roald Amundsens Gate 2
Oslo 1

tel. (2) 42 80 30

Country : NORWAY
Currency : KRONOR
Revision : November 1976

I – FOREGROUND
1) 110 – 300 BAUDS SERVICE

ON	TCH	KCH	CRU	PSU	DSU	HSU
A	0 - 20 90.00 .20 66.00	2.30	0 - 3200 1.35 >3200 1.15	10.00	6.15	6.15
B	103.00	0 - 500 1.80 >500 1.20	0 - 2000 1.50 >2000 1.35	8.80	0 - 200 3.80 >200 2.00	1.25
C	0 - 15 108.00 15 - 45 92.00 >45 68.00	0 - 250 2.35 250 - 750 1.80 >750 0.95	0 - 2000 1.50 2000 - 6000 1.40 >6000 1.20	0 - 180 11.00 180 - 540 10.00 >540 8.00	0 - 90 6.50 90 - 270 4.50 >270 1.30	1.25

2) **1 200 BAUDS SERVICE :**

PLAN 1	TCT	:	320.00	
	KCH	:		NC
PLAN 2	TCT	:	160.00	
	KCH	:	1.60	

3) **2 400 - 4 800 BAUDS SERVICE :**

	TCH	:	170.00	
	INPUT/OUTPUT	:	2.15	/100 records

II - B A C K G R O U N D :

1) G C O S :

CRU (Computer Resource Unit)	:	2 700.00
DSU (Data Storage Unit)	:	1.50
Magnetic Tape Storage/reel month	:	30.00
Tape mount : - secured	:	
- unsecured	:	

2) V S :

CRU (Computer Resource Unit)	:
ISU (Information Storage Unit)	:
Removable disc/month 3336	:
" " " 2316	:
Disc mount	:
Magnetic tape : reel month	:
Tape mount	:

III - M I S C E L L A N E O U S

FIXED CHARGES :

1. Initial fees Mark III	:	1 000.00
2. Minimum monthly charge	:	500.00
3. Minimum charge per invoice	:	
4. Archival administration charges	:	

Archival storage	:	50.00	per file/operation
Archival retrieve	:	100.00	per file/operation
ASU Archival Storage Unit	:	0.20	per storage unit/ month

5. Administrative charges for modifications :

a) For each modification, addition or cancellation of the customer code :
- by operation : 200.00
- minimum per operation : 400.00

b) For restauration of customer programs :

- by program (in the fortnight that follows its date of deleting on the disc) : 100.00
- by program (between 15 days and 6 months) : 150.00
- minimum charge by operation : 250.00

No restauration after 6 months.

c) File transfer :

- per file :
- minimum per operation :
- maximum per operation :

d) for another option, per change : 400.00

IV - MEDIA CONVERSION SERVICES

Disc to tape	:	
Tape to disc	:	
Disc to printer (1 part)	: 55.00	/1000 lines
Disc to printer (2 to 3 part)	: 65.00	/1000 lines
Card to disc	: 55.00	/1000 cards
Disc to punch	: 110.00	/1000 cards
Minimum per job	: 115.00	

Cards and paper are included in the tariff.

Freight and communication to or from MCS center and all other accessory costs are charged to the customer in addition to above cost.

Honeywell

MARK III PRICES

HONEYWELL BULL S.A.
Avenida del Generalissimo 80
Madrid 16

tel. (1) 259.78.00

Country : SPAIN
Currency : peseta
Revision : November 1976

I - FOREGROUND
1) 110 - 300 BAUDS SERVICE

ION	TCH	KCH	CRU	PSU	DSU	HSU
A	0 - 20 20		0 - 3200 > 3200			
B		0 - 500 > 500	0 - 2000 > 2000		0 - 200 > 200	
C	0 - 15 1210 15 - 45 1015.00 > 45 725	0 - 250 26 250 - 750 19 > 750 9	0 - 2000 16 2000 - 6000 14 > 6000 12	0 - 180 129 180 - 540 116 > 540 97	0 - 90 79 90 - 270 54 > 270 16	13
D	1 050	NC	16	138	83	13

2) 1 200 BAUDS SERVICE :

    PLAN 1   TCT   :
                     KCH   :   NC

    PLAN 2   TCT   :
                     KCH   :

3) 2 400 – 4 800 BAUDS SERVICE :

                     TCH   :
                     INPUT/OUTPUT   :   /100 records

II - B A C K G R O U N D :

1)   G C O S :

    CRU (Computer Resource Unit)   :
    DSU (Data Storage Unit)   :
    Magnetic Tape Storage/reel month   :
    Tape mount   :   - secured   :
                       - unsecured   :

2)   V S :

    CRU (Computer Resource Unit)   :
    ISU (Information Storage Unit)   :
    Removable disc/month 3336   :
        "   "   " 2316   :
    Disc mount   :
    Magnetic tape : reel month   :
    Tape mount   :

III - M I S C E L L A N E O U S

FIXED CHARGES :

1. Initial fees Mark III   : 13 855.00
2. Minimum monthly charge   :
3. Minimum charge per invoice   : 1 700.00
4. Archival administration charges   :

    Archival storage   :   490.00   per file/operation
    Archival retrieve   :   980.00   per file/operation
    ASU Archival Storage Unit   :   2.00   per storage unit/
                                             month

5. Administrative charges for modifications :

  a) For each modification, addition or cancellation of the customer code :

    - by operation   : 1 890.00
    - minimum per operation   : 3 780.00

  b) For restauration of customer programs :

    - by program (in the fortnight that follows its
      date of deleting on the disc)   : 1 120.00
    - by program (between 15 days and 6 months) : 1 540.00
    - minimum charge by operation   : 2 240.00

No restauration after 6 months.

  c) File transfer :

    - per file   : 1 120.00
    - minimum per operation   :   -
    - maximum per operation   :   -

  d) for another option, per change   :

IV - M E D I A   C O N V E R S I O N   S E R V I C E S

  Disc to tape   :

  Tape to disc   :

  Disc to printer (1 part)   :   /1000 lines

  Disc to printer (2 to 3 part)   :   /1000 lines

  Card to disc   :   /1000 cards

  Disc to punch   :   /1000 cards

  Minimum per job   :

Cards and paper are included in the tariff.

Freight and communication to or from MCS center and all other accessory costs
are charged to the customer in addition to above cost.

International Accounts – F. Danzebrink
HB NIS – Tour Atlantique
92080 – Paris la Défense – Cedex 06
tél. 776 44 92 – tlx. 611764 F

Honeywell

MARK III PRICES

Honeywell Information Services A.B.
Sveavägen 163 – Box 23 163
10435 Stockholm
tél. (8) 24 66 20

Country : SWEDEN
Currency : KRONOR
Revision : November 1976

I – FOREGROUND
1) 110 – 300 BAUDS SERVICE

ON	TCH	KCH	CRU	PSU	DSU	HSU
A	0 – 20 67.00 20 47.00	1.90	0 – 3200 1.00 > 3200 0.90	8.90	5.60	5.60
B	78.00	0 – 500 1.45 > 500 0.85	0 – 2000 1.20 > 2000 1.10	7.80	0 – 200 3.45 > 200 1.70	0.90
⟩	0 – 15 78.00 15 – 45 67.00 > 45 47.00	0 – 250 1.90 250 – 750 1.40 > 750 0.65	0 – 2000 1.20 2000 – 6000 1.05 > 6000 0.85	0 – 180 8.90 180 – 540 7.95 > 540 6.70	0 – 90 5.60 90 – 270 3.80 > 270 1.10	0.90

2) **1 200 BAUDS SERVICE :**

PLAN 1	TCT	:	
	KCH	:	NC
PLAN 2	TCT	:	
	KCH	:	

3) **2 400 - 4 800 BAUDS SERVICE :**

	TCH	:	
	INPUT/OUTPUT	:	/100 records

II - B A C K G R O U N D :

1) **G C O S :**

CRU (Computer Resource Unit)	:	2 100.00
DSU (Data Storage Unit)	:	1.25
Magnetic Tape Storage/reel month	:	21.00
Tape mount : - secured	:	
- unsecured	:	

2) **V S :**

CRU (Computer Resource Unit)	:
ISU (Information Storage Unit)	:
Removable disc/month 3336	:
" " " 2316	:
Disc mount	:
Magnetic tape : reel month	:
Tape mount	:

III - M I S C E L L A N E O U S

FIXED CHARGES :

1. Initial fees Mark III	:	785.00	
2. Minimum monthly charge	:	785.00	
3. Minimum charge per invoice	:		
4. Archival administration charges	:		
Archival storage	:	34.00	per file/operation
Archival retrieve	:	68.00	per file/operation
ASU Archival Storage Unit	:	0.15	per storage unit/ month

5. Administrative charges for modifications :

a) For each modification, addition or cancellation of the customer code :
   - by operation   :   155.00
   - minimum per operation   :   310.00

b) For restauration of customer programs :
   - by program (in the fortnight that follows its date of deleting on the disc)   :   92.00
   - by program (between 15 days and 6 months)   :   127.00
   - minimum charge by operation   :   310.00

No restauration after 6 months.

c) File transfer :
   - per file   :   18.00
   - minimum per operation   :   100.00
   - maximum per operation   :

d) for another option, per change   :

IV - MEDIA CONVERSION SERVICES

Disc to tape	:	
Tape to disc	:	
Disc to printer (1 part)	: 40.00	/1000 lines
Disc to printer (2 to 3 part)	: 47.00	/1000 lines
Card to disc	: 40.00	/1000 cards
Disc to punch	: 80.00	/1000 cards
Minimum per job	: 90.00	

Cards and paper are included in the tariff.

Freight and communication to or from MCS center and all other accessory costs are charged to the customer in addition to above cost.

International Accounts - F. Danzebrink
HB NIS - Tour Atlantique
92080 - Paris la Défense - Cedex 06
tél. 776 44 92 - tlx. 611764 F

Honeywell

MARK III PRICES

HONEYWELL INFORMATION SERVICES AG

Chemin des Mines 2

1202 - GENEVE

tel. (022) 31.42.50

Hoeschgasse 61

8008 - ZURICH

tel. (01) 34.57.26

Country : SWITZERLAND
Currency : Franc
Revision : January 1977

I - FOREGROUND
1) 110 - 300 BAUDS SERVICE

ON	TCH	KCH	CRU	PSU	DSU	HSU
A	0 - 20 42.50 20 30.00	1.05	0 - 3200 0.55 > 3200 0.50	5.40	3.20	3.20
B	46.50	0 - 500 0.80 > 500 0.50	0 - 2000 0.60 > 2000 0.55	4.80	0 - 200 2.00 > 200 1.00	0.55
C	0 - 15 46.50 15 - 45 39.10 > 45 30.00	0 - 250 1.05 250 - 750 0.80 > 750 0.40	0 - 2000 0.60 2000 - 6000 0.55 > 6000 0.50	0 - 180 5.40 180 - 540 4.85 > 540 4.10	0 - 90 3.20 90 - 270 2.20 > 270 0.65	0.55
D	41.00	-	0.60	5.75	3.40	0.55

2) 1 200 BAUDS SERVICE :

PLAN 1	TCT	:	156.00	
	KCH	:		NC
PLAN 2	TCT	:	78.00	
	KCH	:	0.80	

3) 2 400 - 4 800 BAUDS SERVICE :

	TCH	:	85.00	
	INPUT/OUTPUT	:	1.05	/100 records

II - B A C K G R O U N D :

1) G C O S :

CRU (Computer Resource Unit)	:1	460.00
DSU (Data Storage Unit)	:	0.50
Magnetic Tape Storage/reel month	:	13.00
Tape mount : - secured	:	4.50
- unsecured	:	11.00

2) V S :

CRU (Computer Resource Unit)	:1	565.00
ISU (Information Storage Unit)	:	4.25
Removable disc/month 3336	:	390.00
" " " 2316	:	155.00
Disc mount	:	52.00
Magnetic tape : reel month	:	13.00
Tape mount	:	5.00

III - M I S C E L L A N E O U S

FIXED CHARGES :

1. Initial fees Mark III	:	700.00	
2. Minimum monthly charge	:		
3. Minimum charge per invoice	:	55.00	
4. Archival administration charges	:		
Archival storage	:	22.00	per file/operation
Archival retrieve	:	44.00	per file/operation
ASU Archival Storage Unit	:	0.10	per storage unit/ month

· MARK III PRICES

5. Administrative charges for modifications :

a) For each modification, addition or cancellation of the customer code :
   - by operation   :   90.00
   - minimum per operation   :   180.00

b) For restauration of customer programs :
   - by program (in the fortnight that follows its
     date of deleting on the disc)   :   52.50
   - by program (between 15 days and 6 months)   . :   72.00
   - minimum charge by operation   :   105.00

No restauration after 6 months.

c) File transfer :
   - per file   :   10.00
   - minimum per operation   :   52.50
   - maximum per operation   :   260.00

d) for another option, per change   :   180.00

IV - M E D I A   C O N V E R S I O N   S E R V I C E S

Disc to tape   :

Tape to disc   :

Disc to printer (1 part)   :   /1000 lines

Disc to printer (2 to 3 part)   :   /1000 lines

Card to disc   :   /1000 cards

Disc to punch   :   /1000 cards

Minimum per job   :

Cards and paper are included in the tariff.

Freight and communication to or from MCS center and all other accessory costs
are charged to the customer in addition to above cost.

Honeywell

MARK III* NETWORK INFORMATION SERVICE

MARK III Network Information Service is normally available for access between 08.00 and 22.00 hours Mondays to Fridays inclusive in each week and may be provided additionally outside these periods.

The following charges are subject to the Company's terms and conditions. The Company reserves the right to modify its terms, conditions and charges at any time prior to the completion of a contract.

A. **INITIAL CHARGE** An initial charge of £25.00 is made in consideration of the Company validating the Service.

B. **MINIMUM CHARGE** A minimum charge of £20.00 per month per invoice is made in respect of the Service applying as from the start of the third calendar month following the date the Service is available to the Customer.

C. **MONTHLY CHARGES**

	£
1. **Terminal Connect Time** (for transmission speeds up to 300 bits per second)	
First 20 hours per month	5.35 per hour
Hours in excess of 20 per month	3.25 per hour
2. **Input/Output Characters** Kch = 1000 characters (for transmission speeds up to 300 bits per second)	
First 500 Kch per month	0.14 per Kch
Kch in excess of 500 per month	0.08 per Kch
3. **High Speed Service Terminal Connect Time** (for transmission speeds of up to 2400 bits per second)	4.25 per hour
4. **High Speed Service Input/Output Records** (for transmission speeds up to 2400 bits per second)	0.10 per 100 Records

		£

5. **Computer Resource Units**   0.07 per CRU

For programs which do not require on-line interaction,
significant economies may be obtained by the use of
'INDEPENDENT RUN'. This facility provides users with
approximately 40 per cent reduction in processing (CRUs)
on deferring a run by three hours and approximately
60 per cent reduction in processing on deferring a run
overnight.

6. **Storage (SU = 1280 characters)**
  (a) Program Storage Units (PSU)
      First 100 PSUs stored for one month   0.80 per PSU
      PSUs in excess of 100 stored for one month   0.50 per PSU

  (b) Data Storage Units (DSU)   0.15 per DSU

  (c) HISAM Data Storage Units (HSU)
      First 1000 HSUs stored for one month   0.15 per HSU
      HSUs in excess of 1000 stored for one month   0.085 per HSU

  (d) Archival Storage Units (ASU)
      Per month or part month   0.01 per ASU
      Instruction to store   2.50 per file
      Instruction to retrieve   5.00 per file

7. **Background Service**
  (a) Background Computer Resource Unit   220.00 per BCRU
      (Background Computer Resource
      was previously calculated and charged
      in units – sometimes referred to as
      BBU – of one ten thousanth of the BCRU.)

      Various priority options are available:
      (i)   Super Express Service (start within 4 minutes);
           CRUs are consumed at 4 times the normal rate

      (ii) Express Service (start within 15 minutes);
           CRUs are consumed at twice the normal rate

      (iii) Normal Service (start within 3 hours)

      (iv) Overnight Service (start within 24 hours);
           CRUs are consumed at 0.75 times the normal rate

  (b) Storage
      (i)   Data Storage Units (BDSU) per month   0.085 per month

      (ii) Magnetic Tape per month or portion thereof   3.00 per reel

8. **Media Conversion Service**
   (High Speed Session conducted by the Company on
   its premises at request of a user)

   (a) Terminal Connect Time   10.00 per hour

   (b) Input/Output Records   0.10 per 100 Records

9. **Administrative Charges**
   (a) User Number/Password Changes
        Per Change   1.00
        Minimum Charge per request   10.00

   (b) File Transfers
        Per file   2.00
        Minimum Charge per request   10.00

   (c) File Restoration
        Per file request within 10 days   10.00
        Per file request within 3 months   15.00
        Minimum charge per request   25.00

   (d) Background: Secured Tape Mount   1.00
                    Unsecured Tape Mount   3.00

The above rates do not include provision of terminal equipment which may be purchased or rented from
the Company, nor telephone call charges nor Post Office equipment rental, details of which may be
obtained from the Post Office direct or from the Company representative.

NOTES

1. Terminal Connect Time is charged for time elapsed between acceptance of the user's sign-on number
    and acceptance of the user's sign-off command by the computer.

2. Input/Output character charges cover the cost of transmission of characters at speeds up to 300 bits per
    second between the user's terminal and the computer.

3. Input/Output record charges cover the cost of transmission of records at a speed of 2400 bits per
    second between the user's terminal and the computer.

4. Computer Resource Units (CRUs) are a measure of the central processor facilities used for a job as
    determined by the computer. Background Computer Resource Units usage information is displayed as
    units and four decimal places. Users may check Background processing usage per activity by issuing
    the command BRE (SOURCE) followed by the job identification code.

5. Foreground Storage is charged on programs and data files retained in the computer for user's recall.
    Storage charges for each month (PSUs, DSUs and HSUs) are based on an average of the level of storage
    recorded during the month, calculated as the average for each day between the peak level and the
    overnight shutdown level; these daily averages are then themselves averaged to give the level charged
    for the month.

Four methods of storage are offered and may be utilised in any combination:

a. **Program Storage Units (PSUs)** of 1280 characters. PSUs consist of immediately accessible data listable by the user.

b. **Data Storage Units (DSUs)** which are the binary equivalent of 1280 characters of non-listable data, immediately accessible by the user.

c. **HISAM Storage Units (HSUs)** which are the binary equivalent of 1280 characters of non-listable data to be accessed only by the MARK III Hierarchical Index Sequential Access Method (HISAM) subroutines and related library programs, e.g., DMS.

d. **Archival Storage Units (ASUs)**, equivalent to PSUs, DSUs or HSUs but stored on off-line magnetic tape for non-immediate access. Storage and retrieval of an archival file normally require 24 hours from entry of instruction by the user; one-time charges are made per instructions as shown.

   Once a disk file (PSU, DSU or HSU) has been copied into archival storage it continues to incur disk storage charges until purged in the usual way.

System commands other than Archival Storage commands will operate on the disk copy of the file only.

Background Storage is calculated in units (BDSU) consisting of 320 36-bit words.

Users may check the charges being levied by the computer during or after any session at the terminal by the system command 'ACTivity' which prints out the number of CRUs, Connect Time and Kilocharacter count accumulated since the start of the session; storage may be checked by use of the command 'DEScribe' for any one file name or 'MDS' (Master Describe) for details of all files stored.

The local Honeywell Network Information Services Manager will be pleased to assist should you require additional information.

2) 1 200 BAUDS SERVICE :

PLAN 1	TCT	: 1 120.00	
	KCH	:	NC
PLAN 2	TCT	: 560.00	
	KCH	: 5.60	

3) 2 400 - 4 800 BAUDS SERVICE :

| | TCH | : 600.00 | |
| | INPUT/OUTPUT | : 5.60 | /100 records |

II - B A C K G R O U N D :

1) G C O S :

CRU (Computer Resource Unit)	: 10 200.00
DSU (Data Storage Unit)	: 3.36
Magnetic Tape Storage/reel month	: 93.00
Tape mount : - secured	:
- unsecured	:

2) V S :

CRU (Computer Resource Unit)	:
ISU (Information Storage Unit)	:
Removable disc/month 3336	:
" " " 2316	:
Disc mount	:
Magnetic tape : reel month	:
Tape mount	:

III - M I S C E L L A N E O U S

FIXED CHARGES :

1. Initial fees Mark III	: 3 800.00	
2. Minimum monthly charge	: 6 300.00	
3. Minimum charge per invoice	:	
4. Archival administration charges	:	
Archival storage	: 160.00	per file/operation
Archival retrieve	: 320.00	per file/operation
ASU Archival Storage Unit	: 0.70	per storage unit/ month

5. Administrative charges for modifications :

a) For each modification, addition or cancellation of the customer code :
- by operation : 630.00
- minimum per operation : 1 260.00

b) For restauration of customer programs :
- by program (in the fortnight that follows its date of deleting on the disc) : 370.00
- by program (between 15 days and 6 months) : 510.00
- minimum charge by operation : 750.00

No restauration after 6 months.

c) File transfer :
- per file : 75.00
- minimum per operation : 370.00
- maximum per operation : 1 860.00

d) for another option, per change : 1 260.00

IV - MEDIA CONVERSION SERVICES

Disc to tape	:	
Tape to disc	:	
Disc to printer (1 part)	:	110.00 /1000 lines
Disc to printer (2 to 3 part)	:	140.00 /1000 lines
Card to disc	:	175.00 /1000 cards
Disc to punch	:	350.00 /1000 cards
Minimum per job	:	390.00

Cards and paper are included in the tariff.

Freight and communication to or from MCS center and all other accessory costs are charged to the customer in addition to above cost.

MARK III PRICES

GENERAL TIME SHARE S.A.
56, avenue des Arts
B – 1040 – BRUXELLES
(Belgique)

tel. (02) 511 07 40
tlx. 23697 BUGLT BRU

Country : BELGIUM
Currency : Francs
Revision : November 1976

I – F O R E G R O U N D
   1) 110 – 300 BAUDS SERVICE

ON	TCH	KCH	CRU	PSU	DSU	HSU
A	0 - 20 675.00 20 466.00	17.25	0 - 3200 9.00 ⟩ 3200 7.50	83.00	51.00	50.00
B	777.00	0 - 500 12.75 ⟩ 500 8.00	0 - 2000 10.00 ⟩ 2000 9.00	73.00	0 - 200 31.25 ⟩ 200 15.00	8.50
	0 - 15 777.00 15 - 45 652.00 ⟩ 45 466.00	0 - 250 17.25 250 - 750 12.75 ⟩ 750 6.00	0 - 2000 10.00 2000 - 6000 9.25 ⟩ 6000 7.50	0 - 180 83.00 180 - 540 75.00 ⟩ 540 62.00	0 - 90 51.00 90 - 270 34.50 ⟩ 270 10.50	8.50
	675.00	NC	10.00	88.00	54.50	8.50

2) 1 200 BAUDS SERVICE :

PLAN 1	TCT	:	2 185.00
	KCH	:	NC
PLAN 2	TCT	:	1 092.00
	KCH	:	11.25

3) 2 400 - 4 800 BAUDS SERVICE :

TCH	: 1 163.00	
INPUT/OUTPUT	: .14.50	/100 records

II - B A C K G R O U N D :

1) G C O S :

CRU (Computer Resource Unit)	:	20 321.00
DSU (Data Storage Unit)	:	6.50
Magnetic Tape Storage/reel month	:	182.00
Tape mount : - secured	:	
- unsecured	:	

2) V S :

CRU (Computer Resource Unit)	:	21 773.00
ISU (Information Storage Unit)	:	60.00
Removable disc/month 3336	:	5 443.00
" " " 2316	:	2 177.00
Disc mount	:	728.00
Magnetic tape : reel month	:	182.00
Tape mount	:	73.00

III - M I S C E L L A N E O U S

FIXED CHARGES :

1. Initial fees Mark III	:	7 394.00
2. Minimum monthly charge	:	7 394.00
3. Minimum charge per invoice	:	
4. Archival administration charges	:	

Archival storage	:	404.00	per file/operation
Archival retrieve	:	809.00	per file/operation
ASU Archival Storage Unit	:	1.75	per storage unit/ month

5. Administrative charges for modifications :

a) For each modification, addition or cancellation of the customer code :
   - by operation   : 1 264.00
   - minimum per operation   : 2 529.00

b) For restauration of customer programs :
   - by program (in the fortnight that follows its
     date of deleting on the disc)   :   708.00
   - by program (between 15 days and 6 months)   : 1 012.00
   - minimum charge by operation   : 1 416.00

No restauration after 6 months.

c) File transfer :
   - per file   :   152.00
   - minimum per operation   :   708.00
   - maximum per operation   : 3 540.00

d) for another option, per change   : 2 529.00

IV - M E D I A   C O N V E R S I O N   S E R V I C E S

Disc to tape   :

Tape to disc   :

Disc to printer (1 part)   :   405.00   /1000 lines

Disc to printer (2 to 3 part)   :   506.00   /1000 lines

Card to disc   :   405.00   /1000 cards

Disc to punch   :   809.00   /1000 cards

Minimum per job   :   809.00

Cards and paper are included in the tariff.

Freight and communication to or from MCS center and all other accessory costs
are charged to the customer in addition to above cost.

ial Charge   Initial Charge Paid on signing   kr. 1.500,00

Charges   Usage is accounted for by project number
               and by type on a month to month basis:

	Per Unit	Step 1 kr.	Step 2 kr.	Step 3 kr.
minal Connect Hours (TCH)	Hour	120,00	85,00	70,00
ut/Output Characters (KC)	1000 ch.	2,10	1,50	1,00
puter Resource Units (CPU)	CPU	1,50	0,95	0,75
gram Storage Units (PSU)	Month	11,00	8,00	5,50
a Storage Units (DSU)	Month	3,00	2,00	1,50
am Storage Units (HSU)	Month	1,50	1,00	0,75

applicable steps are:

t	Step 1	Step 2	Step 3
	0 - 20	20 - 50	50 and over
	0 - 500	500 - 1.500	1.500 and over
	0 - 4.000	4.000 - 7.000	7.000 and over
	0 - 200	200 - 500	500 and over
	0 - 200	200 - 500	500 and over,
	0 - 200	200 - 500	500 and over

f-line, ASU per month   kr. 0,20
ensfer to off-line   -   45,00
ansfer from off-line   -   90,00

rote Media Service (High Speed Printer and Punch Card Reader)

	Step 1	Step 2
0 records	kr. 7,50	kr. 5,00

ep 1: 0 - 10.000 records per job.
ep 2: 10.000 and over records per job.
nimum per job kr. 270,00.

eral
----

nimum monthly charge kr. 500,00
e above minimum charge is to be effective from the end of the third
lendar month after subscription.
ove prices are exclusive V.A.T.

BACKGROUND PRICELIST

		Per Unit	nkr.
oround	Input and output through Foreground		
	Processortime:	CPU	2.700,00
	Tape mount		
	Unsecured tape	Piece	35,00
	Secured tape	Piece	20,00
	Storage:		
	Rental of on-line disc	320 Word/Month	0,00
	Rental of tape	Piece/Month	36,00
	Processortime:	CRU	2.700,00
	Tape mount	Piece	20,00
	Removable disc mount	Piece	00,00
	Storage,,rental of:		
	On-line disc	13030 characters per month	7,50
	Removable disc, 3336	Piece/Month	675,00
	Removable disc, 2316	Piece/Month	280,00
	Tape	Piece/Month	36,00

Valid as of 1976-11-01.

TERMINAL PRICELIST

tal per month:
ivery of terminal and/or terminal equipment   kr. 750.00

	Standard kr.	12 Months kr.	36 Months kr.
miNet 300	1.970,00	1.635,00	1.400,00
der/Punch Unit	870,00	710,00	600,00
ent 733 ASR			
al cassette)	1.675,00	1.450,00	1.200,00

mination of rental subject to following advance notice:

standard rental 1 month's notice.

12 month's rental 3 month's notice, but not until after 12
th's rental.

36 month's rental 3 month's notice, but not until after 36
th's rental.

tal charges are inclusive service.

chase:
------

miNet 300	kr. 33.785,00
der/Punch Unit, GNT model 40	kr. 15.800,00
ent 733 ASR (dual cassette)	kr. 27.050,00

ve prices relate to new equipment and are inclusive delivery.

ve prices are exclusive V.A.T.
delivery terminals are provided with paper etc.

lid from 1976-11-01.

International Accounts – F. Danzebrink
HB NIS – Tour Atlantique
92080 – Paris la Défense – Cedex 06
tél. 776 44 92 – tlx. 611764 F

Honeywell

MARK III PRICES

OY NOKIA AB
Laskentaskeskus – Opastinsilta 8E
00520 Helsinki 52

(tel. 14.00.22)

Country : FINLAND
Currency : MARK
Revision : NOVEMBER 1976

I – FOREGROUND
1) 110 – 300 BAUDS SERVICE

ON	TCH	KCH	CRU	PSU	DSU	HSU
A	0 - 20 20		0 - 3200 > 3200			
B		0 - 500 > 500	0 - 2000 > 2000		0 - 200 > 200	
C	0 - 15 66.00 15 45 55.00 > 45 40.00	0 - 250 1.40 250 - 750 1.05 > 750 0.50	0 2000 0.75 2000 6000 0.65 > 6000 0.55	0 - 180 6.70 180 - 540 6.00 > 540 5.00	0 - 90 4.10 90 - 270 2.80 > 270 0.80	0.70
D						

2) 1 200 BAUDS SERVICE :

    PLAN 1   TCT   :
                              KCH   :   NC

    PLAN 2   TCT   :
                              KCH   :

3) 2 400 - 4 800 BAUDS SERVICE :

                            TCH   :
                            INPUT/OUTPUT   :   ..   /100 records

II - B A C K G R O U N D :

1)   G C O S :

CRU (Computer Resource Unit)   :   2 060.00
DSU   (Data Storage Unit)   :   0.60
Magnetic Tape Storage/reel month   :
Tape mount   :   - secured   :
                     - unsecured   :

2)   V S :

CRU (Computer Resource Unit)   :
ISU (Information Storage Unit)   :
Removable disc/month 3336   :
     "   "   "   2316   :
Disc mount   :
Magnetic tape : reel month   :
Tape mount   :

III - M I S C E L L A N E O U S

FIXED CHARGES :

1. Initial fees Mark III   :   400.00
2. Minimum monthly charge   :
3. Minimum charge per invoice   :   50.00
4. Archival administration charges   :

   Archival storage   :   30.00   per file/operation
   Archival retrieve   :   60.00   per file/operation
   ASU Archival Storage Unit   :   0.15   per storage unit/
                                                  month

International Accounts - F. Danzebrink
HB NIS - Tour Atlantique
92080 - Paris la Défense - Cedex 06
tél. 776 44 92 - tlx. 611764 F

Honeywell

MARK III PRICES

HB NETWORK INFORMATION SERVICES
Tour Atlantique
92080 - PARIS LA DEFENSE
Cedex 06

tel. (1) 776.44.92
tlx. 661 764 F HBNISPA

Country : FRANCE
Currency : franc
Revision : November 1976

I - FOREGROUND
1) 110 - 300 BAUDS SERVICE

ION	TCH	KCH	CRU	P SU	D SU	HSU
A	0 - 20 75.60 / 20 52.30	1.95	0 - 3200 1.00 / >3200 0.84	9.30	5.70	0.92
B	87.20	0 - 500 1.47 / >500 0.90	0 - 2000 1.13 / >2000 1.00	8.20	0 - 200 3.50 / >200 1.70	0.92
C	0 - 15 87.20 / 15 - 45 73.20 / >45 52.30	0 - 250 1.95 / 250 - 750 1.43 / >750 0.67	0 - 2000 1.13 / 2000 - 6000 1.00 / >6000 0.84	0 - 180 9.30 / 180 - 540 8.40 / >540 7.00	0 - 90 5.70 / 90 - 270 3.85 / >270 1.13	0.92
D	75.60	NC	1.13	9.90	6.10	0.92

2) 1 200 BAUDS SERVICE :

   PLAN 1   TCT   :   300.00
                  KCH   :   NC

   PLAN 2   TCT   :   150.00
                  KCH   :   1.50

3) 2 400 - 4 800 BAUDS SERVICE :

                  TCH   :   150.00
                  INPUT/OUTPUT :   1.85   /100 records

II - B A C K G R O U N D :

1) G C O S :

CRU (Computer Resource Unit)	: 2 540.00
DSU (Data Storage Unit)	: 1.50
Magnetic Tape Storage/reel month	: 23.00
Tape mount : - secured	: 9.00
- unsecured	:

2) V S :

CRU (Computer Resource Unit)	: 2 705.00
ISU (Information Storage Unit)	: 7.30
Removable disc/month 3336	: 677.00
" " " 2316	: 270.00
Disc mount	: 90.00
Magnetic tape : reel month	: 23.00
Tape mount	: 9.00

III - M I S C E L L A N E O U S

FIXED CHARGES :

1. Initial fees Mark III	: 910.00	
2. Minimum monthly charge	: 1 000.00	
3. Minimum charge per invoice	:	
4. Archival administration charges	:	
Archival storage	: 40.00	per file/operation
Archival retrieve	: 82.00	per file/operation
ASU Archival Storage Unit	: 0.17	per storage unit/ month

5. Administrative charges for modifications :

a) For each modification, addition or cancellation of the customer code :
   - by operation   :   155.00
   - minimum per operation   :   310.00

b) For restauration of customer programs :
   - by program (in the fortnight that follows its
     date of deleting on the disc)   :   92.00
   - by program (between 15 days and 6 months)   :   128.00
   - minimum charge by operation   :   184.00

No restauration after 6 months.

c) File transfer :
   - per file   :   33.00
   - minimum per operation   :   165.00
   - maximum per operation   :   825.00

d) for another option, per change   :   155.00

IV - MEDIA CONVERSION SERVICES

Disc to tape   :

Tape to disc   :

Disc to printer (1 part)   :   49.00 /1000 lines

Disc to printer (2 to 3 part)   :   55.00 /1000 lines

Card to disc   :   49.00 /1000 cards

Disc to punch   :   98.00 /1000 cards

Minimum per job   :   105.00

Cards and paper are included in the tariff.

Freight and communication to or from MCS center and all other accessory costs
are charged to the customer in addition to above cost.

International Accounts – F. Danzebrink
HB NIS – Tour Atlantique
92080 – Paris la Défense – Cedex 06
tél. 776 44 92 – tlx. 611764 F

Honeywell

MARK III PRICES

Country : GERMANY

Currency : Mark

Revision : November 1976

I – F O R E G R O U N D
1) 110 – 300 BAUDS SERVICE

N	TCH	KCH	CRU	PSU	DSU	HSU
	0 – 20 38.00 20 28.00	0.95	0 – 3200 0.55 > 3200 0.45	4.90	2.95	2.95
	45.00	0 – 500 0.75 > 500 0.45	0 – 2000 0.60 > 2000 0.55	4.25	0 – 200 1.90 > 200 0.95	0.48
	0 – 15 45.00 15 – 45 38.00 > 45 27.00	0 – 250 0.95 250 – 750 0.70 > 750 0.33	0 – 2000 0.60 2000 – 6000 0.55 > 6000 0.45	0 – 180 4.90 180 – 540 4.40 > 540 3.65	0 – 90 2.95 90 – 270 2.00 > 270 0.60	0.48
	38.00	NC	0.60	5.20	3.15	0.48

2) 1 200 BAUDS SERVICE :

PLAN 1	TCT	: 116.00	
	KCH	:	NC
PLAN 2	TCT	: 58.00	
	KCH	: 0.58	

3) 2 400 - 4 800 BAUDS SERVICE :

TCH	: 62.00	
INPUT/OUTPUT	: 0.77	/100 records

II - B A C K G R O U N D :

1) G C O S :

CRU (Computer Resource Unit)	:1 080.00
DSU (Data Storage Unit)	: 0.35
Magnetic Tape Storage/reel month	: 10.00
Tape mount : - secured	: 4.00
- unsecured	: 10.00

2) V S :

CRU (Computer Resource Unit)	:1 160.00
ISU (Information Storage Unit)	: 3.10
Removable disc/month 3336	: 290.00
" " " 2316	: 115.00
Disc mount	: 40.00
Magnetic tape : reel month	: 10.00
Tape mount	: 4.00

III - M I S C E L L A N E O U S

FIXED CHARGES :

1. Initial fees Mark III	: 500.00	
2. Minimum monthly charge	: 500.00	
3. Minimum charge per invoice	: 500.00	
4. Archival administration charges	:	
Archival storage	: 25.00	per file/operation
Archival retrieve	: 50.00	per file/operation
ASU Archival Storage Unit	: 0.10	per storage unit/ month

5. Administrative charges for modifications :

a) For each modification, addition or cancellation of the customer code :
- by operation   :   80.00
- minimum per operation   : 160.00

b) For restauration of customer programs :
- by program (in the fortnight that follows its
  date of deleting on the disc)   :   50.00
- by program (between 15 days and 6 months)   :   70.00
- minimum charge by operation   : 100.00

No restauration after 6 months.

c) File transfer :
- per file   :   10.00
- minimum per operation   :   50.00
- maximum per operation   : 250.00

d) for another option, per change   : 160.00

IV - M E D I A   C O N V E R S I O N   S E R V I C E S

Disc to tape   :

Tape to disc   :

Disc to printer (1 part)   :   14.00   /1000 lines

Disc to printer (2 to 3 part)   :   18.00   /1000 lines

Card to disc   :   23.00   /1000 cards

Disc to punch   :   46.00   /1000 cards

Minimum per job   :   50.00

Cards and paper are included in the tariff.

Freight and communication to or from MCS center and all other accessory costs
are charged to the customer in addition to above cost.

International Accounts – F. DANZEBRINK
HB NIS – Tour Atlantique
92080 – PARIS LA DEFENSE

Honeywell

tel. 776.44.92 – tlx. 611764 F

MARK III PRICES

Honeywell Information Systems
Via M. Gioa 70
20124 – MILANO

tel. (2) 68.87.241

Country : Italy
Currency : lire
Revision : December 1976

I - GENERAL

1) Initial Fees : 100 000

2) Two types of contracts resulting in two
   different billing prices :

   A. Monthly commitment for a minimum of : 50 000 lire/monthly

   B. Monthly commitment for a minimum of : 250 000 lire/monthly

II – F O R E G R O U N D

1) 110 – 300 BAUDS SERVICE :

	A	B
TCH option 1	9 000	8 000
KCH option 1	250	200
TCH option 2	16 000	14 000
KCH option 2	–	–
CRU	140	130
PSU	1 500	1 400
DSU	400	300
HSU	150	100
ASU	25	20
STORE PER FILE	7 000	6 000
RETRIEVE PER FILE	14 000	12 000

2) 1 200 BAUDS SERVICE :

	A	B
TCH option 1	18 000	15 000
KCH option 1	200	150
TCH option 2	35 000	30 000
KCH option 2	–	–

3) 2 400 BAUDS SERVICE

	A	B
TCH	18 000	15 000
I/O 100 records	200	150

III – B A C K G R O U N D

	A	B
1) G C O S		
CRU	400 000	350 000
DSU	120	100
TAPE/REEL/MONTHLY STORAGE	3 000	3 000
TAPE MOUNT NON SECURED	3 600	3 600
TAPE MOUNT SECURED	1 200	1 200
2) V S		
CRU	400 000	350 000
ISU	1 200	1 000
DISC PACK 3336/MONTH	90 000	90 000
2316/MONTH	36 000	36 000
DISC MOUNT	12 000	12 000
MAGNETIC TAPE REEL/MONTH	3 000	3 000
TAPE MOUNT	1 200	1 200

IV – M E D I A   C O N V E R S I O N   S E R V I C E S

DISC TO CARD	4	per card
CARD TO DISC	. 1	per card
PRINT 1 PART	1	per line
PRINT 2 OR 3 PARTS	4	per line
MINIMUM PER JOB	10 000	

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MARK III PRICES

Honeywell Information Services B.V.
Vliegtuigstraat 26
Amsterdam 1017

tel. (020) 15.89.55

Country : NETHERLANDS
Currency : GULDEN
Revision : NOVEMBER 1976

I - FOREGROUND
1) 110 - 300 BAUDS SERVICE

ION	TCH	KCH	CRU	PSU	DSU	HSU
A	0 - 20		0 - 3200			
	20		> 3200			
B		0 - 500	0 - 2000		0 - 200	
		> 500	> 2000		> 200	
C	0 - 15 42.75	0 - 250 0.90	0 - 2000 0.55	0 - 180 4.65	0 - 90 2.65	
	15 - 45 36.00	250 - 750 0.65	2000 - 6000 0.50	180 - 540 4.15	90 - 270 1.80	0.50
	> 45 25.65	> 750 0.30	> 6000 0.40	> 540 3.45	> 270 0.50	

2) 1 200 BAUDS SERVICE :

PLAN 1	TCT	:	136.00	
	FCH	:		NC
PLAN 2	TCT	:	68.00	
	KCH	:	0.68	

3) 2 400 - 4 800 BAUDS SERVICE :

TCH	:	70.00	
INPUT/OUTPUT	:	1.00	/100 records

II - B A C K G R O U N D :

1) G C O S :

CRU (Computer Resource Unit)	:	1 275.00
DSU (Data Storage Unit)	:	0.50
Magnetic Tape Storage/reel month	:	10.00
Tape mount : - secured	:	
- unsecured	:	

2) V S :

CRU (Computer Resource Unit)	:
ISU (Information Storage Unit)	:
Removable disc/month 3336	:
" " " 2316	:
Disc mount	:
Magnetic tape : reel month	:
Tape mount	:

III - M I S C E L L A N E O U S

FIXED CHARGES :

1. Initial fees Mark III	:	250.00	
2. Minimum monthly charge	:	–	
3. Minimum charge per invoice	:	50.00	
4. Archival administration charges	:		
Archival storage	:	22.50	per file/operation
Archival retrieve	:	45.00	per file/operation
ASU Archival Storage Unit	:	0.10	per storage unit/ month

5. Administrative charges for modifications :

    a) For each modification, addition or cancellation of the customer code :
    - by operation   :   6.00
    - minimum per operation   :   30.00

    b) For restauration of customer programs :
    - by program (in the fortnight that follows its   :   30.00
      date of deleting on the disc)
    - by program (between 15 days and 6 months)   :   45.00
    - minimum charge by operation   :   75.00

No restauration after 6 months.

    c) File transfer :
    - per file   :   6.00
    - minimum per operation   :   30.00
    - maximum per operation   :   150.00

    d) for another option, per change   :

IV - MEDIA CONVERSION SERVICES

    Disc to tape   :

    Tape to disc   :

    Disc to printer (1 part)   :   24.50   /1000 lines

    Disc to printer (2 to 3 part)   :   28.20   /1000 lines

    Card to disc   :   24.50   /1000 cards

    Disc to punch   :   48.50   /1000 cards

    Minimum per job   :   50.00

Cards and paper are included in the tariff.

Freight and communication to or from MCS center and all other accessory costs
are charged to the customer in addition to above cost.

Honeywell

MARK III PRICES

Honeywell Information Services A/S
Roald Amundsens Gate 2
Oslo 1

tel. (2) 42 80 30

Country : NORWAY
Currency : KRONOR
Revision : November 1976

I - FOREGROUND
1) 110 - 300 BAUDS SERVICE

ON	TCH	KCH	CRU	PSU	DSU	HSU
A	0 - 20 90.00 .20 66.00	2.30	0 - 3200 1.35 > 3200 1.15	10.00	6.15	6.15
B	103.00	0 - 500 1.80 > 500 1.20	0 - 2000 1.50 > 2000 1.35	8.80	0 - 200 3.80 > 200 2.00	1.25
	0 - 15 108.00 15 - 45 92.00 > 45 68.00	0 - 250 2.35 250 - 750 1.80 > 750 0.95	0 - 2000 1.50 2000 - 6000 1.40 > 6000 1.20	0 - 180 11.00 180 - 540 10.00 > 540 8.00	0 - 90 6.50 90 - 270 4.50 > 270 1.30	1.25

2) 1 200 BAUDS SERVICE :

PLAN 1	TCT	:	320.00
	KCH	:	NC
PLAN 2	TCT	:	160.00
	KCH	:	1.60

3) 2 400 - 4 800 BAUDS SERVICE :

	TCH	:	170.00
	INPUT/OUTPUT	:	2.15	/100 records

II - B A C K G R O U N D :

1) G C O S :

CRU (Computer Resource Unit)	:	2 700.00
DSU (Data Storage Unit)	:	1.50
Magnetic Tape Storage/reel month	:	30.00
Tape mount : - secured	:	
- unsecured	:	

2) V S :

CRU (Computer Resource Unit)	:
ISU (Information Storage Unit)	:
Removable disc/month 3336	:
" " " 2316	:
Disc mount	:
Magnetic tape : reel month	:
Tape mount	:

III - M I S C E L L A N E O U S

FIXED CHARGES :

1. Initial fees Mark III	:	1 000.00	
2. Minimum monthly charge	:	500.00	
3. Minimum charge per invoice	:		
4. Archival administration charges	:		
Archival storage	:	50.00	per file/operation
Archival retrieve	:	100.00	per file/operation
ASU Archival Storage Unit	:	0.20	per storage unit/ month

MARK III PRICES

5. Administrative charges for modifications :

   a) For each modification, addition or cancellation of the customer code :
      - by operation : 200.00
      - minimum per operation : 400.00

   b) For restauration of customer programs :
      - by program (in the fortnight that follows its date of deleting on the disc) : 100.00
      - by program (between 15 days and 6 months) : 150.00
      - minimum charge by operation : 250.00

   No restauration after 6 months.

   c) File transfer :
      - per file :
      - minimum per operation :
      - maximum per operation :

   d) for another option, per change : 400.00

V - MEDIA CONVERSION SERVICES

Disc to tape	:	
Tape to disc	:	
Disc to printer (1 part)	: 55.00	/1000 lines
Disc to printer (2 to 3 part)	: 65.00	/1000 lines
Card to disc	: 55.00	/1000 cards
Disc to punch	: 110.00	/1000 cards
Minimum per job	: 115.00	

Cards and paper are included in the tariff.

Freight and communication to or from MCS center and all other accessory costs are charged to the customer in addition to above cost.

Honeywell

MARK III PRICES

HONEYWELL BULL S.A.
Avenida del Generalissimo 80
Madrid 16

tel. (1) 259.78.00

Country :	SPAIN
Currency :	peseta
Revision :	November 1976

I - F O R E G R O U N D
1) 110 - 300 BAUDS SERVICE

ON	TCH	KCH	CRU	PSU	DSU	HSU
A	0 - 20		0 - 3200			
	20		> 3200			
B		0 - 500	0 - 2000		0 - 200	
		> 500	> 2000		> 200	
C	0 - 15	0 - 250	0 - 2000	0 - 180	0 - 90	
	1210	26	16	129	79	
	15 - 45	250 - 750	2000 - 6000	180 - 540	90 - 270	
	1015.00	19	14	116	54	13
	> 45	> 750	> 6000	> 540	> 270	
	725	9	12	97	16	
D	1 050	NC	16	138	83	13

2) 1 200 BAUDS SERVICE :

PLAN 1   TCT   :

              KCH   :   NC

PLAN 2   TCT   :

              KCH   :

3) 2 400 - 4 800 BAUDS SERVICE :

              TCH   :

              INPUT/OUTPUT   :   /100 records

II - B A C K G R O U N D :

1)   G C O S :

CRU (Computer Resource Unit)   :

DSU   (Data Storage Unit)   :

Magnetic Tape Storage/reel month   :

Tape mount   :   - secured   :

                   - unsecured   :

2)   V S :

CRU (Computer Resource Unit)   :

ISU (Information Storage Unit)   :

Removable disc/month 3336   :

     "   "   "   2316   :

Disc mount   :

Magnetic tape : reel month   :

Tape mount   :

III - M I S C E L L A N E O U S

FIXED CHARGES :

1. Initial fees Mark III	: 13 855.00		
2. Minimum monthly charge	:		
3. Minimum charge per invoice	: 1 700.00		
4. Archival administration charges	:		
Archival storage	:	490.00	per file/operation
Archival retrieve	:	980.00	per file/operation
ASU Archival Storage Unit	:	2.00	per storage unit/ month

5. Administrative charges for modifications :

a) For each modification, addition or cancellation of the customer code :
- by operation   : 1 890.00
- minimum per operation   : 3 780.00

b) For restauration of customer programs :
- by program (in the fortnight that follows its date of deleting on the disc)   : 1 120.00
- by program (between 15 days and 6 months)   : 1 540.00
- minimum charge by operation   : 2 240.00

No restauration after 6 months.

c) File transfer :
- per file   : 1 120.00
- minimum per operation   :   —
- maximum per operation   :   —

d) for another option, per change   :

IV - MEDIA CONVERSION SERVICES

Disc to tape	:	
Tape to disc	:	
Disc to printer (1 part)	:	/1000 lines
Disc to printer (2 to 3 part)	:	/1000 lines
Card to disc	:	/1000 cards
Disc to punch	:	/1000 cards
Minimum per job	:	

Cards and paper are included in the tariff.

Freight and communication to or from MCS center and all other accessory costs are charged to the customer in addition to above cost.

Honeywell

MARK III PRICES

Country : SWEDEN
Currency : KRONOR
Revision : November 1976

I - FOREGROUND
1) 110 - 300 BAUDS SERVICE

ON	TCH	KCH	CRU	PSU	DSU	HSU
A	0 - 20 67.00 20 47.00	1.90	0 - 3200 1.00 >3200 0.90	8.90	5.60	5.60
B	78.00	0 - 500 1.45 >500 0.85	0 - 2000 1.20 >2000 1.10	7.80	0 - 200 3.45 >200 1.70	0.90
	0 - 15 78.00 15 - 45 67.00 >45 47.00	0 - 250 1.90 250 - 750 1.40 >750 0.65	0 - 2000 1.20 2000 - 6000 1.05 >6000 0.85	0 - 180 8.90 180 - 540 7.95 >540 6.70	0 - 90 5.60 90 - 270 3.80 >270 1.10	0.90

2) 1 200 BAUDS SERVICE :

PLAN 1   TCT   :

                      KCH   :   NC

PLAN 2   TCT   :

                      KCH   :

3) 2 400 – 4 800 BAUDS SERVICE :

                      TCH   :

                      INPUT/OUTPUT   :   /100 records

II – B A C K G R O U N D :

1) G C O S :

CRU (Computer Resource Unit)	:	2 100.00
DSU (Data Storage Unit)	:	1.25
Magnetic Tape Storage/reel month	:	21.00
Tape mount : – secured	:	
– unsecured	:	

2) V S :

CRU (Computer Resource Unit)	:
ISU (Information Storage Unit)	:
Removable disc/month 3336	:
" " " 2316	:
Disc mount	:
Magnetic tape : reel month	:
Tape mount	:

III – M I S C E L L A N E O U S

FIXED CHARGES :

1. Initial fees Mark III	:	785.00	
2. Minimum monthly charge	:	785.00	
3. Minimum charge per invoice	:		
4. Archival administration charges	:		
Archival storage	:	34.00	per file/operation
Archival retrieve	:	68.00	per file/operation
ASU Archival Storage Unit	:	0.15	per storage unit/ month

5. Administrative charges for modifications :

   a) For each modification, addition or cancellation of the customer code :
      - by operation   : 155.00
      - minimum per operation   : 310.00

   b) For restauration of customer programs :
      - by program (in the fortnight that follows its date of deleting on the disc)   : 92.00
      - by program (between 15 days and 6 months)   : 127.00
      - minimum charge by operation   : 310.00

   No restauration after 6 months.

   c) File transfer :
      - per file   : 18.00
      - minimum per operation   : 100.00
      - maximum per operation   :

   d) for another option, per change   :

V - MEDIA CONVERSION SERVICES

Disc to tape	:	
Tape to disc	:	
Disc to printer (1 part)	: 40.00	/1000 lines
Disc to printer (2 to 3 part)	: 47.00	/1000 lines
Card to disc	: 40.00	/1000 cards
Disc to punch	: 80.00	/1000 cards
Minimum per job	: 90.00	

Cards and paper are included in the tariff.

Freight and communication to or from MCS center and all other accessory costs are charged to the customer in addition to above cost.

MARK III PRICES

HONEYWELL INFORMATION SERVICES AG

Chemin des Mines 2

1202 -GENEVE

tel. (022) 31.42.50

Hoeschgasse 61

8008 - ZURICH

tel. (01) 34.57.26

Country : SWITZERLAND

Currency : Franc

Revision : January 1977

I - FOREGROUND
1) 110 - 300 BAUDS SERVICE

ON	TCH	KCH	CRU	PSU	DSU	HSU
A	0 - 20 42.50 20 30.00	1.05	0 - 3200 0.55 > 3200 0.50	5.40	3.20	3.20
B	46.50	0 - 500 0.80 > 500 0.50	0 - 2000 0.60 > 2000 0.55	4.80	0 - 200 2.00 > 200 1.00	0.55
	0 - 15 46.50 15 - 45 39.10 > 45 30.00	0 - 250 1.05 250 - 750 0.80 > 750 0.40	0 - 2000 0.60 2000 - 6000 0.55 > 6000 0.50	0 - 180 5.40 180 - 540 4.85 > 540 4.10	0 - 90 3.20 90 - 270 2.20 > 270 0.65	0.55
	41.00	-	0.60	5.75	3.40	0.55

2) 1 200 BAUDS SERVICE :

    PLAN 1   TCT   : 156.00
                        KCH   :   NC

    PLAN 2   TCT   :   78.00
                        KCH   :   0.80

3) 2 400 - 4 800 BAUDS SERVICE :

                        TCH   :   85.00
                        INPUT/OUTPUT   :   1.05   /100 records

II - B A C K G R O U N D :

1) G C O S :

    CRU (Computer Resource Unit)   :1 460.00
    DSU (Data Storage Unit)   :   0.50
    Magnetic Tape Storage/reel month   :   13.00
    Tape mount   :   - secured   :   4.50
                         - unsecured   :   11.00

2) V S :

    CRU (Computer Resource Unit)   :1 565.00
    ISU (Information Storage Unit)   :   4.25
    Removable disc/month 3336   : 390.00
         "   "   " 2316   : 155.00
    Disc mount   :   52.00
    Magnetic tape : reel month   :   13.00
    Tape mount   :   5.00

III - M I S C E L L A N E O U S

    FIXED CHARGES :

    1. Initial fees Mark III   : 700.00
    2. Minimum monthly charge   ;
    3. Minimum charge per invoice   :   55.00
    4. Archival administration charges   :

    Archival storage   :   22.00   per file/operation
    Archival retrieve   :   44.00   per file/operation
    ASU Archival Storage Unit   :   0.10   per storage unit/
                                                                month

5. Administrative charges for modifications : .

   a) For each modification, addition or cancellation of the customer code :
      - by operation   :   90.00
      - minimum per operation   :   180.00

   b) For restauration of customer programs :
      - by program (in the fortnight that follows its
        date of deleting on the disc)   :   52.50
      - by program (between 15 days and 6 months)   :   72.00
      - minimum charge by operation   :   105.00

   No restauration after 6 months.

   c) File transfer :
      - per file   :   10.00
      - minimum per operation   :   52.50
      - maximum per operation   :   260.00

   d) for another option, per change   :   180.00

IV – M E D I A   C O N V E R S I O N   S E R V I C E S

   Disc to tape   :

   Tape to disc   :

   Disc to printer (1 part)   :   /1000 lines

   Disc to printer (2 to 3 part)   :   /1000 lines

   Card to disc   :   /1000 cards

   Disc to punch   :   /1000 cards

   Minimum per job   :

   Cards and paper are included in the tariff.

   Freight and communication to or from MCS center and all other accessory costs
   are charged to the customer in addition to above cost.

Honeywell

MARK III* NETWORK INFORMATION SERVICE

MARK III Network Information Service is normally available for access between 08.00 and 22.00 hours Mondays to Fridays inclusive in each week and may be provided additionally outside these periods.

The following charges are subject to the Company's terms and conditions. The Company reserves the right to modify its terms, conditions and charges at any time prior to the completion of a contract.

A. **INITIAL CHARGE** An initial charge of £25.00 is made in consideration of the Company validating the Service.

B. **MINIMUM CHARGE** A minimum charge of £20.00 per month per invoice is made in respect of the Service applying as from the start of the third calendar month following the date the Service is available to the Customer.

C. **MONTHLY CHARGES**

	£
1. Terminal Connect Time (for transmission speeds up to 300 bits per second) First 20 hours per month Hours in excess of 20 per month	 5.35 per hour 3.25 per hour
2. Input/Output Characters Kch= 1000 characters (for transmission speeds up to 300 bits per second) First 500 Kch per month Kch in excess of 500 per month	 0.14 per Kch 0.08 per Kch
3. High Speed Service Terminal Connect Time (for transmission speeds of up to 2400 bits per second)	 4.25 per hour
4. High Speed Service Input/Output Records (for transmission speeds up to 2400 bits per second)	 0.10 per 100 Records

	£
5. Computer Resource Units	0.07 per CRU

For programs which do not require on-line interaction, significant economies may be obtained by the use of 'INDEPENDENT RUN'. This facility provides users with approximately 40 per cent reduction in processing (CRUs) on deferring a run by three hours and approximately 60 per cent reduction in processing on deferring a run overnight.

6. Storage (SU = 1280 characters)

		£
(a)	Program Storage Units (PSU)	
	First 100 PSUs stored for one month	0.80 per PSU
	PSUs in excess of 100 stored for one month	0.50 per PSU
(b)	Data Storage Units (DSU)	0.15 per DSU
(c)	HISAM Data Storage Units (HSU)	
	First 1000 HSUs stored for one month	0.15 per HSU
	HSUs in excess of 1000 stored for one month	0.085 per HSU
(d)	Archival Storage Units (ASU)	
	Per month or part month	0.01 per ASU
	Instruction to store	2.50 per file
	Instruction to retrieve	5.00 per file

7. Background Service

(a)	Background Computer Resource Unit (Background Computer Resource was previously calculated and charged in units — sometimes referred to as BBU — of one ten thousanth of the BCRU.)	220.00 per BCRU

Various priority options are available:

(i) Super Express Service (start within 4 minutes); CRUs are consumed at 4 times the normal rate

(ii) Express Service (start within 15 minutes); CRUs are consumed at twice the normal rate

(iii) Normal Service (start within 3 hours)

(iv) Overnight Service (start within 24 hours); CRUs are consumed at 0.75 times the normal rate

(b)	Storage	
	(i) Data Storage Units (BDSU) per month	0.085 per month
	(ii) Magnetic Tape per month or portion thereof	3.00 per reel

8. **Media Conversion Service**
   (High Speed Session conducted by the Company on
   its premises at request of a user)

   (a) Terminal Connect Time   10.00 per hour

   (b) Input/Output Records   0.10 per 100 Records

9. **Administrative Charges**

   (a) User Number/Password Changes

	£
Per Change	1.00
Minimum Charge per request	10.00

   (b) File Transfers

	£
Per file	2.00
Minimum Charge per request	10.00

   (c) File Restoration

	£
Per file request within 10 days	10.00
Per file request within 3 months	15.00
Minimum charge per request	25.00

   (d) Background:

	£
Secured Tape Mount	1.00
Unsecured Tape Mount	3.00

The above rates do not include provision of terminal equipment which may be purchased or rented from the Company, nor telephone call charges nor Post Office equipment rental, details of which may be obtained from the Post Office direct or from the Company representative.

NOTES

1. Terminal Connect Time is charged for time elapsed between acceptance of the user's sign-on number and acceptance of the user's sign-off command by the computer.

2. Input/Output character charges cover the cost of transmission of characters at speeds up to 300 bits per second between the user's terminal and the computer.

3. Input/Output record charges cover the cost of transmission of records at a speed of 2400 bits per second between the user's terminal and the computer.

4. Computer Resource Units (CRUs) are a measure of the central processor facilities used for a job as determined by the computer. Background Computer Resource Units usage information is displayed as units and four decimal places. Users may check Background processing usage per activity by issuing the command BRE (SOURCE) followed by the job identification code.

5. Foreground Storage is charged on programs and data files retained in the computer for user's recall. Storage charges for each month (PSUs, DSUs and HSUs) are based on an average of the level of storage recorded during the month, calculated as the average for each day between the peak level and the overnight shutdown level; these daily averages are then themselves averaged to give the level charged for the month.

Four methods of storage are offered and may be utilised in any combination:

a. Program Storage Units (PSUs) of 1280 characters. PSUs consist of immediately accessible data listable by the user.

b. Data Storage Units (DSUs) which are the binary equivalent of 1280 characters of non-listable data, immediately accessible by the user.

c. HISAM Storage Units (HSUs) which are the binary equivalent of 1280 characters of non-listable data to be accessed only by the MARK III Hierarchical Index Sequential Access Method (HISAM) subroutines and related library programs, e.g., DMS.

d. Archival Storage Units (ASUs), equivalent to PSUs, DSUs or HSUs but stored on off-line magnetic tape for non-immediate access. Storage and retrieval of an archival file normally require 24 hours from entry of instruction by the user; one-time charges are made per instructions as shown.

Once a disk file (PSU, DSU or HSU) has been copied into archival storage it continues to incur disk storage charges until purged in the usual way.

System commands other than Archival Storage commands will operate on the disk copy of the file only.

Background Storage is calculated in units (BDSU) consisting of 320 36-bit words.

6 Users may check the charges being levied by the computer during or after any session at the terminal by the system command 'ACTivity' which prints out the number of CRUs, Connect Time and Kilocharacter count accumulated since the start of the session; storage may be checked by use of the command 'DEScribe' for any one file name or 'MDS' (Master Describe) for details of all files stored.

7 The local Honeywell Network Information Services Manager will be pleased to assist should you require additional information.

Honeywell

PRICE LIST

-Effective 1st October 1976

MARK III* NETWORK INFORMATION SERVICE

MARK III Network Information Service is normally available for access between 08.00 and 22.00 hours Mondays to Fridays inclusive in each week and may be provided additionally outside these periods.

The following charges are subject to the Company's terms and conditions. The Company reserves the right to modify its terms, conditions and charges at any time prior to the completion of a contract.

A. **INITIAL CHARGE** An initial charge of £25.00 is made in consideration of the Company validating the Service.

B. **MINIMUM CHARGE** A minimum charge of £20.00 per month per invoice is made in respect of the Service applying as from the start of the third calendar month following the date the Service is available to the Customer.

C. **MONTHLY CHARGES**

	£
1. Terminal Connect Time (for transmission speeds up to 300 bits per second)	
First 20 hours per month	5.35 per hour
Hours in excess of 20 per month	3.25 per hour
2. Input/Output Characters Kch= 1000 characters (for transmission speeds up to 300 bits per second)	
First 500 Kch per month	0.14 per Kch
Kch in excess of 500 per month	0.08 per Kch
3. High Speed Service Terminal Connect Time (for transmission speeds of up to 2400 bits per second)	4.25 per hour
4. High Speed Service Input/Output Records (for transmission speeds up to 2400 bits per second)	0.10 per 100 Records

This Information Sheet supersedes No. 00.01.071

Ref. No. 00.01.07J

Honeywell I.S. Ltd, 114-118 Southampton Row, London WC1B 5AB

	£

5. **Computer Resource Units** — 0.07 per CRU

For programs which do not require on-line interaction,
significant economies may be obtained by the use of
'INDEPENDENT RUN'. This facility provides users with
approximately 40 per cent reduction in processing (CRUs)
on deferring a run by three hours and approximately
60 per cent reduction in processing on deferring a run
overnight.

6. **Storage (SU = 1280 characters)**
   (a) Program Storage Units (PSU)
      First. 100 PSUs stored for one month — 0.80 per PSU
      PSUs in excess of 100 stored for one month — 0.50 per PSU

   (b) Data Storage Units (DSU) — 0.15 per DSU

   (c) HISAM Data Storage Units (HSU)
      First 1000 HSUs stored for one month — 0.15 per HSU
      HSUs in excess of 1000 stored for one month — 0.085 per HSU

   (d) Archival Storage Units (ASU)
      Per month or part month — 0.01 per ASU
      Instruction to store — 2.50 per file
      Instruction to retrieve — 5.00 per file

7. **Background Service**
   (a) Background Computer Resource Unit — 220.00 per BCRU
      (Background Computer Resource
      was previously calculated and charged
      in units — sometimes referred to as
      BBU -- of one ten thousandth of the BCRU.)

      Various priority options are available:
      (i)   Super Express Service (start within 4 minutes);
            CRUs are consumed at 4 times the normal rate

      (ii) Express Service (start within 15 minutes);
            CRUs are consumed at twice the normal rate

      (iii) Normal Service (start within 3 hours)

      (iv) Overnight Service (start within 24 hours);
            CRUs are consumed at 0.75 times the normal rate

   (b) Storage
      (i) Data Storage Units (BDSU) per month — 0.085 per month

      (ii) Magnetic Tape per month or portion thereof — 3.00 per reel

8. **Media Conversion Service**
   (High Speed Session conducted by the Company on
   its premises at request of a user)

   (a) Terminal Connect Time   10.00 per hour

   (b) Input/Output Records   0.10 per 100 Records

9. **Administrative Charges**
   (a) User Number/Password Changes
        Per Change   1.00
        Minimum Charge per request   10.00

   (b) File Transfers
        Per file   2.00
        Minimum Charge per request   10.00

   (c) File Restoration
        Per file request within 10 days   10.00
        Per file request within 3 months   15.00
        Minimum charge per request   25.00

   (d) Background: Secured Tape Mount   1.00
                     Unsecured Tape Mount   3.00

The above rates do not include provision of terminal equipment which may be purchased or rented from the Company, nor telephone call charges nor Post Office equipment rental, details of which may be obtained from the Post Office direct or from the Company representative.

NOTES

1. Terminal Connect Time is charged for time elapsed between acceptance of the user's sign-on number and acceptance of the user's sign-off command by the computer.

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Four methods of storage are offered and may be utilised in any combination:

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b. Data Storage Units (DSUs) which are the binary equivalent of 1280 characters of non-listable data, immediately accessible by the user.

c. HISAM Storage Units (HSUs) which are the binary equivalent of 1280 characters of non-listable data to be accessed only by the MARK III Hierarchical Index Sequential Access Method (HISAM) subroutines and related library programs, e.g., DMS.

d. Archival Storage Units (ASUs), equivalent to PSUs, DSUs or HSUs but stored on off-line magnetic tape for non-immediate access. Storage and retrieval of an archival file normally require 24 hours from entry of instruction by the user; one-time charges are made per instructions as shown.

Once a disk file (PSU, DSU or HSU) has been copied into archival storage it continues to incur disk storage charges until purged in the usual way.

System commands other than Archival Storage commands will operate on the disk copy of the file only.

Background Storage is calculated in units (BDSU) consisting of 320 36-bit words.

6. Users may check the charges being levied by the computer during or after any session at the terminal by the system command 'ACTivity' which prints out the number of CRUs, Connect Time and Kilocharacter count accumulated since the start of the session; storage may be checked by use of the command 'DEScribe' for any one file name or 'MDS' (Master Describe) for details of all files stored.

7. The local Honeywell Network Information Services Manager will be pleased to assist should you require additional information.

Four methods of storage are offered and may be utilised in any combination:

a. Program Storage Units (PSUs) of 1280 characters. PSUs consist of immediately accessible data listable by the user.

b. Data Storage Units (DSUs) which are the binary equivalent of 1280 characters of non-listable data, immediately accessible by the user.

c. HISAM Storage Units (HSUs) which are the binary equivalent of 1280 characters of non-listable data to be accessed only by the MARK III Hierarchical Index Sequential Access Method (HISAM) subroutines and related library programs, e.g., DMS.

d. Archival Storage Units (ASUs), equivalent to PSUs, DSUs or HSUs but stored on off-line magnetic tape for non-immediate access. Storage and retrieval of an archival file normally require 24 hours from entry of instruction by the user; one-time charges are made per instructions as shown.

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7. The local Honeywell Network Information Services Manager will be pleased to assist should you require additional information.

CSC-GE

SUMMARY

●   GEIS is in a peculiar position with its network; when the concept
was initially developed it was the most advanced network in the world.

    At that time, GE still had its own hardware development and
manufacturing operation.

    Since 1970 when Honeywell took over the manufacturing of the large
mainframes in Phoenix, the operating systems have been drifting increas-
ingly further apart.

●   Honeywell has had its own problems trying to maintain and upgrade
GCOS and Multics - one of the peculiarities is that the 635 users can't
use the current GCOS as Multics software.

●   In the meantime, MARK III has also been evolving more slowly and
generally in response to user needs.

●   Lacking R&D funds to develop a new operating system (not a require-
ment, since they believe MARK III to be the best system in the world),
GEIS has been standing still while the rest of the world around them has
been changing. Honeywell has improved GCOS, and Multics added a text
processor, an improved data base management system, and reduced system
overhead. But neither Honeywell or GEIS seems concerned about interconn-
ecting with SNA. GEIS is now studying adding more Honeywell mainframes

using the Honeywell distributed processing protocols.

- The only thing GEIS has done with the IBM software to date is to build a MARK III front end for the VS 370 service. Beyond that, there is no plan to integrate IBM software any further into the network. The service is sold as a necessary adjunct by a small specialized sales force in only three geographic areas. The U.S. Government is one of the major users.

- GEIS benefits greatly from the software developments of its sister divisions. For example, Electric Utility Systems Division (EUSD) contributes all the software packages described in the body of the report, under Utility Industry Packages.

- The improvements and upgrades to the system are often customer generated while the documentation and the decision on how to price and market the product are done by the headquarters industry groups.

- The applications are closely tied into the seven major industry areas described in the body of the report. One of the major tasks of the Industry Manager is to find existing software, preferably within a friendly GE division, and, if not, with a customer if possible.

- GEIS was initially an orphan and was saved by the interest of Art Peltosalo and the messianic quality of George Feeney - who compared the GE network to a utility (a term and an industry well understood by GE's top management).

- GEIS was stuck with lots of obsolete equipment at the time of the Honeywell acquisition and has been paying off that old equipment.

- Feeney promised a future when no company would want to own its computer but would rely instead on a utility such as GE.

- This vision of the future has not happened, and GEIS has been struggling to stay in a position of leadership despite a yearly loss of 20-30% of its customer base to in-house systems.

- To continue functioning as a successful member of the GE family, GEIS has to be profitable (10% after taxes). Therefore, its ability to do R&D or to acquire new equipment is limited by corporate financial guidelines.

GEIS REVENUES ($ Millions)

			1976	1977
GE Remote			15	
GE FM (Switchgear & Lynchburg)			3	
GE Remote Processing & Interactive			3	
TOTAL GE			21	22

IAO 7 x 7 Accounts		Other Ind Accounts	1976	1977
Petroleum	4	3	7	10
Telephone	10	1	11	11
Electric Utilities	5	8	13	19
CPAs	4	3	7	10
Banking & Finance	3	8	11	13
General & Other*	1	11	12 *x*	13.5
	27		*61*	
Total IAO (minus GE internal)	28			

	1976	1977
Government	9	12
IBM VS Service	5.5	6.5
Professional Services	2.5 *17.*	3
	100.00 *99*	120

*General & Other (segmented)

	1976	1977
Medical	2	2.5
Manufacturing	6	7
Architects & Engineers	1	1
Miscellaneous	3	3
	12 *x*	13.5 *x*

International Revenues

	1976	1977
Europe	34.5	40
Japan	5	7
Other	10.5	12
Total	50.00	59
Revenue to GE @ 45% =	22.5	26.5
Total GE Revenues	$122.5	$146.5

• New GEISD price for the Data Entry Mode (DEM) is $1.50 hour connect time, and 10¢ per 1000 characters. RPS III a remote batch terminal, built by CDC, has been replaced by the Terminet III, a 2780 compatible, remote job entry terminal built by General Electric.

• It is interesting to note than an average trained full-time key-punch operator enters 50,000 to 60,000 characters per day which would cost:

       7 hours connect time @ $1.50 hour = $10.50

    + 60,000 characters @ 10¢ per 1,000 = $ 6.00

       Total daily cost   = $16.50

                 X 21 days   =$346.50

If the price is compared to a keypunch or a key-to-disk system the "monthly" charge is high.   But for someone who enters data for one or two hours each day, or weekly, or monthly, and already has a terminal available, DEM is ideal. It also provides a low cost foot in the door to new applications.

• General Electric is not acquisition oriented (Utah International is an exception) and isn't likely to buy any companies in the computer services area. Part of the reason is fear of antitrust action.

GE, however, may spin-off a communication subsidiary when the FCC position on data communications and value added networks becomes clearer.

- GE, on the other hand, does acquire application software and some compilers. It prefers to acquire from sister divisions, customers or even former employees (CAPEX).

- The most successful packages sold by GE are:
  - FAL II Financial Analysis Language introduced in 1973. Presently has over 900 users.
  - DMS II An upgrade to DMS which was introduced in 1972. Presently has over 1200 users.
  - STATSYSTEM A Statistical Analysis System introduced in 1972. Presently has 1300 users.

- These packages are the most popular in the GE Library. Because of their general nature; these software packages are used across a variety of industries by small as well as large users. (For details on their performance, see the description in the body of the report.)